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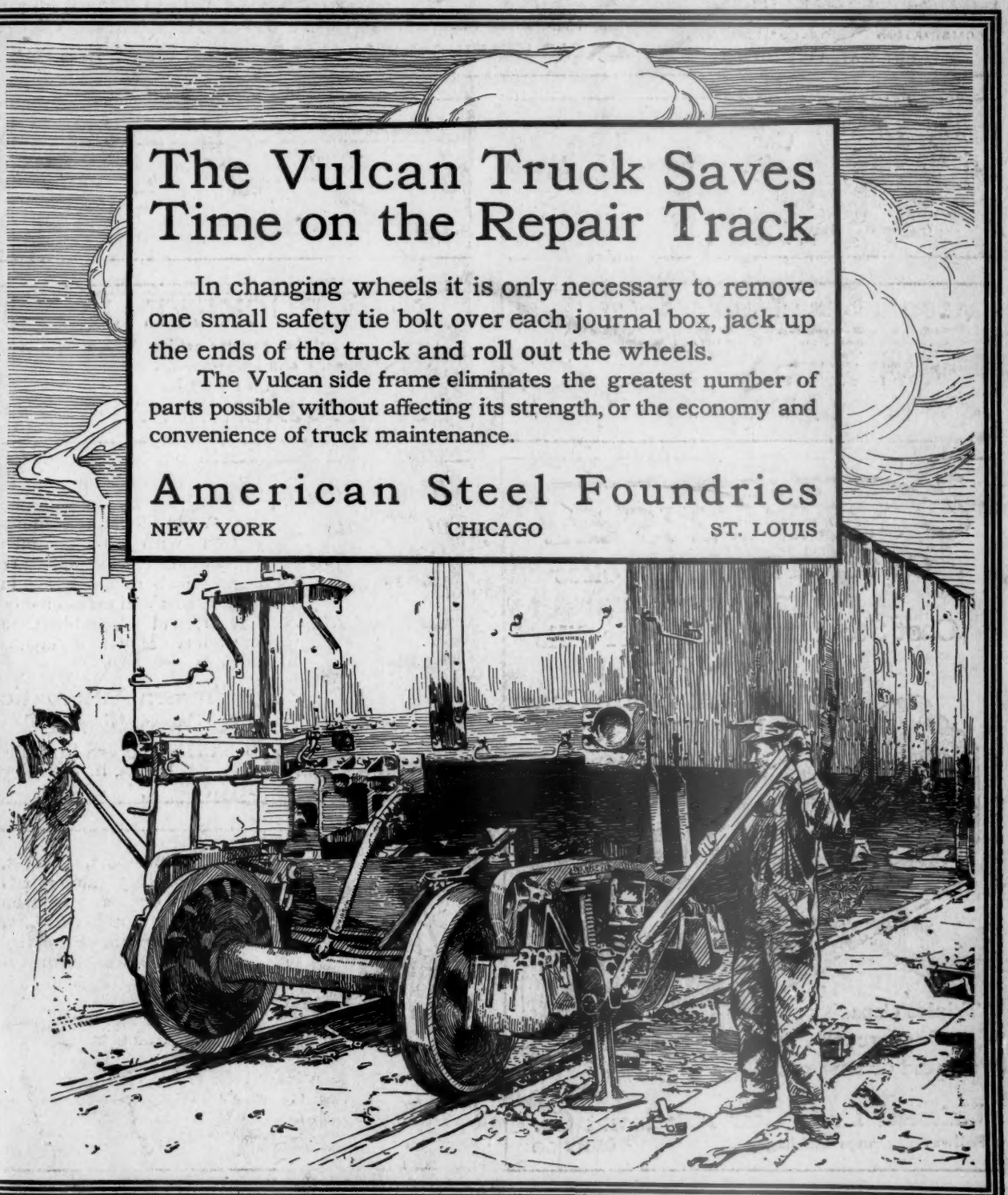
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Railway Age Gazette

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The Car Pool Question

To many operating officers a pool seems to be the only adequate remedy for the injustices which railroads everywhere are obliged to suffer when freight cars are in such great demand as they are at the present time; and by way of giving definiteness to this sentiment the *Railway Age Gazette* has asked a car service expert to summarize the issues as they present themselves today; and his article will be found on another page. It is to be borne in mind, of course, that at the present moment, the Interstate Commerce Commission and the principal railroads are making a concerted effort to get the best attainable results from intelligent and energetic application of the existing rules—based on the principle of individual ownership, the diametrical opposite of the pool. The present article has been written without reference to the Washington movement. It is not presented as an argument; it is printed for the purpose of making clear the principles of car-pooling and to suggest, as far as suggestion is possible, with the paucity of our experience, what results might be expected from a pool covering a large territory. No one denies, of course, that we have a virtual pool today. For several years, in times of stress, everybody has used other roads' box cars as though they were owned (instead of being borrowed, under an agreement promptly to return them); but this lawlessness has been excused on the plea of stern necessity. The problem now being wrestled with by the two commissions—government and railroad—at Washington is to find a way of abolishing this unbusinesslike practice.

The Value of a Test Department

A few years ago the principal factor in selling certain goods to the railroads was the personality of the salesman. The development of the railroad test department has effected a change in the relation of the supply companies to the railroads which has taken place so gradually that it has hardly been noticed. The personality of the salesman is becoming a less important factor, and railroads are basing their purchases to a greater extent on records of actual performance. As a result the supply companies have found it necessary to add sales engineers to their organizations. Basing purchases on the results of tests is a practice which makes for economy in the long run. Whenever it is possible definite records of performance should be secured before purchases involving considerable expenditures are made. The testing department is of material assistance to the operating, maintenance of way and mechanical departments in securing data as to the relative merits of different articles or devices. The importance of this service should be recognized and the testing department should be given the support which it merits. To secure the best results the organization should be such that it would be able to meet the demands of all the departments in the matter of tests of material, and also in investigating methods or testing appliances. The work of testing materials ordered, to see that they meet the company's specifications, is an important branch of the work, but too often the other functions of the testing department are made subordinate to it. In co-operating with the purchasing department the testing department often secures immediate returns, but the greater part of the saving which should be credited to the department is not secured immediately, and the value of the work of this department in developing the most economical methods or in demonstrating the economy of certain devices is often not appreciated. A liberal expenditure along this line will bring splendid results. The testing department should be used not only for testing materials, but also for investigating the merits of new methods and new devices.

The Qualifications of a Division Superintendent

The two letters from division superintendents published in this issue, when taken in connection with the preceding letters covering "An Appeal to the Executives," bring out sharply once again the fact that there is no formula for the making of a first-rate superintendent. A general manager who when he was superintendent was one of the very best in the country, expressed the belief not long ago that a superintendent or general superintendent who came up through the despatcher's office is handicapped by knowing how difficult, if not im-

possible, of accomplishment are the tasks that he sometimes sets his officers and men. He is not firm enough in his unreasonable demands. The superintendent who is praised, the one whom the lower officers are usually told to imitate is the unusual person who sets exceptionally high standards, and in some way or other succeeds in getting them—or some of them—carried out. As a matter of fact, this general manager had, however, himself come up through the despatcher's office, having been both a telegraph operator and a brakeman before serving as train despatcher. It is perfectly true that some few men can, by setting their subordinates almost impossible tasks, get from them a prodigious amount of work; but such men are very rare. They are born leaders of men, and the division superintendent who starts out to model his methods on those of James J. Hill or E. H. Harriman stands a good chance of making a failure of it. More than almost any other class of men, railroad officers, from the general manager down, have to take the rules of the game as they find them and those who are successful are the ones who are not trying to devise a new system to replace the one that they find irksome but who adapt themselves so skilfully to the system already in effect that they succeed in getting out of it all the good there is.

A RATIONAL STUDY OF GRADE CROSSING PROTECTION

THE first essential to the proper solution of any pathological condition is a complete diagnosis of the case. Following this the nature of the treatment recommended should be tempered to the financial ability of the patient to avail himself of it. The Railroad Commission of California is following these eminently practical steps in its endeavor to solve the grade crossing problem within that state. With the rapid increase in the travel on the highways during the last few years, coincident with the great growth in the use of automobiles, the number of accidents has naturally increased. This has led to agitation in California, as elsewhere, for the wholesale elimination of grade crossings, with the burden placed largely, if not entirely, on the railways. In many instances, city officers and even state commissions have lent their support to such campaigns without attempting to ascertain the magnitude of the problem, the amount of the expenditures involved, or the manner in which they can be financed.

The California Commission has approached this problem from a more practical standpoint. Estimating the cost of separating grades at $30,000 per crossing, it found that the total outlay to protect the 10,000 crossings within the state would involve an expenditure of $300,000,000. It also estimated with the fixed charges on this amount would be equal to a tax of $6 on every inhabitant within the state. Realizing the impracticability of making such an expenditure, the Commission set about to study conditions as they actually exist at the individual crossings and then to recommend such safeguards as would afford a practical measure of security. It is highly gratifying to note the success which is attending this method of procedure. As stated in the article describing the work of this Commission, which appears in another column, approximately 1,100 recommendations have been made for the protection of the 2,000 crossings inspected during the 10 months this work has been under way. Of these recommendations 10 per cent of the improvements have already been installed and work is under way on 70 per cent additional.

In this way reasonable precautions are being adopted which will undoubtedly remove a large part of the accidents. At the same time, the Commission has shown its appreciation of the fact that the protection of grade crossings is not a problem for the railways alone. In nearly all instances, the increase in travel has been far greater on the highways than on the railways, while in many instances the crossings have been opened across the railways after the roads have been built. It is by studies of this character that this problem, which is becoming of increasing importance each year, will be settled satisfactorily and with justice to all concerned. By going at this problem in the manner in which it has, the California Commission has set a precedent which other states can well afford to follow.

STUDYING THE APPLIANCE EXHIBIT

OWING to the promise of greatly increased appropriations for maintenance of way and structures during the season of 1917, an unusual impetus will be given the purchase of all classes of supplies and materials used in this work, particularly because an unquestioned shortage of labor will make labor saving devices of particular advantage. This condition increases the importance of the annual exhibit of the National Railway Appliances Association, which will be held from March 19 to 22, during the stated meeting of the Railway Signal Association and the annual convention of the American Railway Engineering Association. The magnitude and high character of this display have been commented upon repeatedly, and the announcement of this year's exhibit, appearing in the *Railway Age Gazette* of February 16, indicates that it will be fully up to the standard set in the past.

In order that the railways may derive the maximum benefit from the exhibit it is important that the men who visit it make every effort to give the display serious attention. To provide a definite plan to encourage a more systematic and thorough consideration of the display, the *Railway Age Gazette,* the Railway Maintenance Engineer and the Railway Signal Engineer, all published by the same company, have united in conducting a competition for descriptions of this exhibit. Because the show naturally divides itself into two general fields, two general divisions of the contest have been decided upon. A first prize of $50, a second prize of $25 and a third prize of $10 will be awarded for the best discussions of practical value to railway men of the exhibit of devices and materials used in the maintenance of way and structures. Another series of prizes of equal amount will be awarded for similar discussions of that portion of the exhibit devoted to signals.

In order to encourage railway men to make a study of the exhibit as a whole, a single prize of $60 will be awarded for the best paper covering the entire exhibit, with the understanding that no individual will be awarded more than one prize. Any paper covering both the signal and maintenance exhibits will be considered for this combination prize, but those that fail to win it will still be eligible for consideration in the two divisions of the contest. If an author does not specify in which contest his paper is to be entered it will be placed in the group in which it is best suited in the judgment of the editors.

Any one employed in railway service is eligible to enter this contest, and papers may be of any length not exceeding 2,500 words. The writers should so study the exhibit that they can discuss materials and devices by classes, rather than by firm names, the latter being used only when necessary to make the meaning clear. The papers should be designed to present information concerning the devices and materials shown in the exhibit, which will be of the greatest value to railway men who do not see the show. Suggestions for making the exhibit of greater benefit to railway men may also be offered. All papers entered in the contest must be mailed not later than April 9, 1917, addressed to the editor of the *Railway Age Gazette,* 608 South Dearborn street, Chicago.

The prizes in the division of the contest referring to the maintenance of way and structures will be awarded by A. S. Baldwin, chief engineer, Illinois Central; C. F. W. Felt,

chief engineer, Atchison, Topeka & Santa Fe, and W. A. Penfield, assistant to the vice-president, Chicago, Milwaukee & St. Paul. The judges for the contest on papers referring to signaling will be J. A. Peabody, signal engineer, Chicago & North Western; H. K. Lowry, signal engineer, Chicago, Rock Island & Pacific, and W. M. Vandersluis, signal engineer, Illinois Central. The single prize of $60 on the best paper covering the exhibit as a whole will be awarded by W. B. Storey, vice-president of the Atchison, Topeka & Santa Fe, in co-operation with Mr. Baldwin and Mr. Peabody.

ANOTHER REPORT ON THE MISSOURI, KANSAS & TEXAS

THE report which has just been made on the Missouri, Kansas & Texas by J. W. Kendrick, formerly vice-president of the Atchison, Topeka & Santa Fe, is essentially a constructive study of the property. It is entirely different in its method of approach to the problem of reorganization from the report made by Coverdale & Colpitts, which was commented on in the *Railway Age Gazette* of February 16. The Kendrick report, as a study of railroad operation, with helpful suggestions for economies and for improved operating methods, is admirable; as a basis on which bankers might found a reorganization plan for the Katy and offer new securities to investors, it is speculative. Moreover, it must be remembered that what may be perfectly legitimate speculation for one class of investor is wholly unjustifiable gambling for another class. Speculative railroad building and speculative investment in railroad securities has been of immeasurable assistance to the rapid development of American railroads. But the question for those who have charge of the reorganization of the Missouri, Kansas & Texas is as to whether they are justified under the conditions which now exist; under the present form of regulation of railroads; the present trend of public opinion and the present attitude of investors, in putting through a railroad reorganization dependent for its success on the absence of unforeseeable unfavorable circumstances.

The receiver's estimate of what the Missouri, Kansas & Texas needs in the way of additions and betterments over a period of years calls for a total expenditure of $65,000,000, and Mr. Kendrick, accepting this figure, estimates that if these expenditures are made and the improved operating methods which he suggests in his report are adopted, the Missouri, Kansas & Texas operating ratio can be brought down to 64½ per cent, comparing with an operating ratio in 1916 or 79.40; in 1915 of 69.81; in 1914 of 72.77; in 1913 of 70.51, and in 1912 of 75.23. It is generally admitted that the average maintenance in 1912 to 1915, inclusive, was not adequate and that the operating ratio in these years was, therefore, lower than it would have been had the property been more fully maintained. On the other hand, as Mr. Kendrick points out, the large amount of rehabilitation work done in 1916 makes the operating ratio in that year unduly high. There can be no doubt that the Missouri, Kansas & Texas needs large expenditures for additions and betterments. Both the Coverdale & Colpitts report and Mr. Kendrick's report demonstrate this fact and the operating officers of the Katy know it full well. Furthermore, the improvements in operating methods which Mr. Kendrick recommends have many of them been tried out with marked success on other roads and in particular cases, where the recommendations which Mr. Kendrick makes might be disputed by other experts, Mr. Kendrick has sound arguments for the support of his contentions. As we understand the Kendrick report, it should not be taken in any way as adverse criticism of the operating management of the road. Such parts of it as may properly be considered "criticism" are all constructive. As a document to be studied with profit by operating officers, the Katy report should be of immense value. Certain portions of it will be published in the *Railway Age Gazette*, not only because the principles laid down by Mr. Kendrick are interesting as applied to the problem before the Katy, but because they may be applied to the problems of railroad operating officers generally. But what about the investors in the present securities of the Missouri, Kansas & Texas and the prospective investor in new securities to be issued under the reorganization plan?

There is not one investor in a thousand who would have the patience or the knowledge to make a study of the Kendrick report on which he could base his individual judgment in voting for or against any particular plan of reorganization. The investor, therefore, should approach even a summary of the Kendrick report with certain general principles clearly in mind. The Kendrick report assumes that for a period of years there will be average good luck for the road. With that average good luck, Mr. Kendrick estimates that an operating ratio of 64½ can be obtained at the end of a series of years, and that even by 1920, with the expenditure of $27,500,000, or one-half of the total that is to be spent under the plan of rehabilitation, the road can pay not only its present interest charges, but interest charges at 6 per cent on this additional $27,500,000 and have a surplus of $3,120,000. If this estimate is accurate and safe to follow, a reorganization plan could be adopted which would leave the road with a considerable proportion of its present fixed charges; but is it safe to follow?

When the present management took hold of the Missouri, Kansas & Texas they had a program for additions and betterments, improved operating conditions, the substitution of heavy locomotives for light, for securing additional drag freight northbound, to increase the trainload and to decrease the operating ratio. The success of this plan was dependent not only on the inherent merits of the plan itself and the skill and energy with which it was carried out, but also on an improvement in the credit of the company which would permit the sale of securities to finance the plan and on an averagely good set of operating conditions. The financing of the Katy's immediate needs through the sale of $19,000,000 notes was a tribute to the great weight which was attached to the financial ability of the new management, rather than to the state of credit of the Katy or other roads in that territory and similarly burdened with fixed charges and with radical state legislation. From 1913 up to the beginning of the present fiscal year the history of the Katy has been one chapter of hard luck after another—floods, the cotton crop failure, and more floods. Hard luck might quite conceivably almost cut in half Mr. Kendrick's estimate of the probable amount available for interest charges in 1920.

In any reorganization of the Katy new money will be needed. This new money can be obtained in one of several ways: the present fixed charges can be so scaled down as to put the credit of the company on a sound basis, rain or shine, and new securities sold on the strength of this credit; or present security-holders can be induced to put up new money under the belief that through the use of this new money not only will no scaling down of their interest be required, but that the property can be made to earn interest also on the new securities which they take; or, again, present fixed charges can be left without radical scaling down, but a new lien placed on the property prior to the great bulk of the present outstanding securities, and on the strength of the nearness of the new mortgage to the rails and the equities in junior claims on earnings, bonds could be sold to investors.

It isn't that the Kendrick report recommends either of the two latter methods, but rather that such methods may be suggested to the bondholder who studies an abstract of this report wherein the danger lies. The danger is that the security-holder will fail to realize that if either of the two latter methods of reorganization is adopted, his position will

be that of a speculator, whereas if the sound principles of reorganization such as those that were followed for the Pere Marquette are adhered to, his loss will be obvious, but it will be over with. If a first mortgage bondholder has to take preferred stock for his bond and the road has another series of four years of extraordinary hard luck, the preferred stockholder will be no worse off than he is now, while if the road has reasonable good luck there is every prospect that the preferred stockholder will be very much better off than he is now.

At the risk of needless repetition it may be said once more that the Kendrick report is a scientific and accurate study of Missouri, Kansas & Texas conditions and needs, but is susceptible, as the Coverdale & Colpitts report was not susceptible, of being misunderstood by Missouri, Kansas & Texas security-holders.

CONGRESS AND THE RAILROAD STRIKE MENACE

UNLESS all signs fail, Congress will adjourn on March 3 without having passed any legislation for the prevention of strikes in railroad train service. If this should be the case it will be a remarkable commentary on government in the United States.

In 1914, at about the time the great war began, a strike which would have interrupted transportation throughout the territory west of Chicago was averted only by concessions by the railroads. Last September a strike that would have paralyzed transportation throughout the United States was averted only by legislation passed hastily by Congress to give the railroad brotherhoods most of what they demanded without any hearing on the merits of the matters which were involved.

The country is now in daily expectation of being drawn into the mightiest war in history. The legislation by which the strike was averted last September is in litigation. The Supreme Court may within a few weeks hand down a decision which will leave the railroads and the labor brotherhoods in much the same position that they were in before that legislation was passed. This means that the nation may be facing both embroilment in the greatest of all wars, and the paralysis of its transportation system by the greatest of all strikes.

If the transportation system of this country should be paralyzed what effective part could the nation take in the war? Even with the railroads operating to their full capacity, industrial and commercial affairs are becoming demoralized because of the restraints that the German submarine campaign has put upon our export business. If interference with our ocean transportation has this effect, what effect would interruption of our rail transportation have, especially at a time when, because of its embroilment in the war, the country might need adequate and efficient transportation service more than it ever did?

And yet Congress is planning to adjourn without passing any measure to prevent a nation-wide strike! Is it because its members regard a strike as a remote possibility? That can not be. They can hardly have forgotten that the leaders of the railway brotherhoods ordered a strike almost simultaneously with the outbreak of the war in Europe in 1914. They can not have forgotten the circumstances under which the order for a strike was issued last September. It is apparently one of the main principles of action of the leaders of the brotherhoods that they shall seize upon the time when the necessities of the railways and the public are the greatest to order strikes on the assumption that while this may be harmful to others it is the course which is most likely to achieve success for the brotherhoods. The action of the switchmen in the Chicago district a short time ago illustrated this principle. They threatened to strike when the congestion in the Chicago terminals was the worst ever known, their idea apparently being that whatever public inconvenience and loss might result, this would be the most opportune occasion for wringing from the railroads the greatest possible concessions.

It cannot be, then, that Congress is under any illusion as to the danger of a strike. It must be that it is governed by some other consideration. Most people think that that other consideration is "politics." Congress knows that there is the strongest reason for fearing that if the Supreme Court should hold the Adamson law unconstitutional the country soon would be face to face again, as it was last September, with the menace of a great strike. But the "labor vote" is opposed to legislation placing any restriction on the right to strike. There are many members of Congress who are afraid of the "labor vote." There is much evidence that there is no such thing as the "labor vote." The leaders of the labor brotherhoods worked openly for the election of Mr. Wilson last November, and he lost almost every state where organized labor is strong. The politicians continue, however, to believe in and tremble before the "labor vote." Therefore, Congress proposes to adjourn and leave the people of the United States at the mercy of Garretson, Stone, Lee and Carter.

There is one ray of hope, however. President Wilson was mainly responsible for the passage of the Adamson law. He was denounced for this, and it alienated from him many persons who previously had supported him. At the same time the President recommended the passage of legislation to place additional obstacles in the way of railway strikes. Failing to secure the passage of this latter legislation, he issued a statement saying he would again try to do so at the session of Congress which is now drawing to a close. In justice to the President it must be said that he has lived up to his promise. He has repeatedly urged legislation for compulsory investigation of railway labor disputes in spite of the determined opposition of the labor brotherhoods. Probably, therefore, the President may be relied on to continue his efforts to establish some means of peaceful settlement of such disputes. It seems not improbable that if a strike became imminent he would even call an extra session of Congress to prevent it.

It is certainly a significant and even portentous fact that it was possible for the President to get rushed through Congress at breakneck speed an act to increase the wages of the train service employees without any investigation, but that it has proved impossible thus far for him to secure any legislative action for the prevention of strikes. The American public will some day pay very dearly for allowing their lawmakers to palter in this manner with questions affecting the most vital interests of the nation.

NEW BOOKS

Railway Freight Connections and Car Interchange Points. 80 pages, 8 in. by 11 in. Paper cover. Published by the Railway Equipment & Publication Company, 75 Church street, New York. Price, single copies, 40 cents each; 100 copies and over, 25 cents each.

This pamphlet is made up from the well-known data contained in the monthly Railway Equipment Register, where, under the head of each railroad company, there is given a list of all the roads with which it makes direct connection with the names of the station at which the connections are located. This pamphlet, weighing only 9 oz., makes a convenient handbook free from that bulky material in the Register to which reference has to be made less frequently. With the strict enforcement of the rules for sending foreign cars home which are now in vogue every station agent, yardmaster and yard clerk has the duty of seeing that no errors are made in the selection of the proper route, which makes a large field for this pamphlet.

Letters to the Editor

A REPRESENTATIVE COMMISSION

WASHINGTON, D. C.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In order to secure a sane, experienced and equitable administration of transportation problems of all kinds, would it not be practicable, feasible and desirable to have an Interstate Commerce Commission composed of a membership selected as follows and along the following lines of action:

From each of the operating divisions of the country, namely, eastern, southern, middle western and pacific, the President of the United States should select one representative of the people as an appointee to this body. The transportation companies whose operations exist mainly in any one district, should by vote select a representative from each district as an appointee to this body. Upon confirmation of their appointments by the Senate, these 10 men should meet and appoint a chairman, who should have the deciding vote on any issue, and whose appointment should also be subject to confirmation by the Senate.

The powers of this body should be almost plenary over all common carriers of any kind that originate freight or passenger traffic in interstate business, whether they operate wholly or partly in any one state, and their decisions subjected only to the decisions of the Supreme Court.

In order to eliminate the confusion and injustice that now exists on account of the acts of various state and civic bodies, they should be eliminated, or made entirely within the jurisdiction of the interstate body. But, in order that each state may have its individual needs taken care of, the governor of each state should appoint a representative of his state before the interstate body, such appointment being subjected to ratification by the governing body of his state.

I am aware that some great change of present conditions is needed. I am trying to suggest a plan for such a change to be made along lines that I do not believe have heretofore been presented. I can see no reason why such a method of solution is not practical, just and effective.

C. E. NEWELL.

FROM THE SUPERINTENDENT OF A PROMINENT DIVISION IN TENNESSEE

TO THE EDITOR OF THE RAILWAY AGE GAZETTE.

The "Protests to railroad executives" recently printed in your columns seem to have arisen from a variety of causes. If you will state a violation of the rules and the record of the employee causing it, to any five operating officers you will receive at least four and possibly five different opinions as to the proper discipline to be applied. It is, therefore, no wonder that occasionally a superintendent's decision is overruled. He, himself, is not infallible and will sometimes make an error, especially if he has to apply discipline while he is worrying over the disgrace brought to his division by the accident which the rule violation caused; for proper and corrective discipline can never be administered in anger.

The day has long since passed when a superintendent can "drive" a division. He must now lead it. In order to do so, he must not only know the details of the business, but must lead a clean, moral, temperate life, doing nothing that he would not allow any of his employees to do. All of us have in our employ men who are just as intelligent and capable as we are, but whom opportunity did not reach, and it is disgusting to such men to be told that they must not do things that they know we do.

A superintendent at all times should be ready to listen to the troubles, real or imaginary, of the most obscure employee. Such employee should be treated in a thoroughly gentlemanly manner, and, of course, fairly. If he is wrong, show him his error; if right assist him in securing his rights. In this way you will make him a friend for life and you will be, so far as he and his friends are concerned, the biggest man on the railroad.

It is my opinion (many differ with me) that a superintendent who does not put in the major portion of his time on the road, and a good part of it on freight trains, in all kinds of weather and under adverse conditions; mingling with and sharing the hardships of the men and observing their ability, is not qualified to administer discipline. He would not know, when a collision, derailment or other mishap occurred, whether it was caused by an honest mistake or by negligence or carelessness; and he must know this, to deal fairly. Such trips give him the very best opportunity to educate his men in the importance of the rules and show them any slack practices they are engaging in; teach them how they can conserve supplies and how to solicit business and hold it. He takes them, as it were, into partnership in the business of the road.

This neglect of personal supervision of the men under actual working conditions, and figuring theoretically (in the office) what they should do, or are doing, is sending more cases to the executives than any other cause; and the fact that there are a great many burdensome rules in our working agreements is not because of "expediency of our executives," but to the absence of personal contact; and to indulgence in sharp practices, lack of diplomacy and favoritism on the part of local division officers. These things give committees a lever with which to "expedite" the executive into conceding the rule.

While it is true that seniority at times places men in positions for which they are not entirely fitted, I should not like to return to the old system of picking the men. It would create more disorganization on the railroads of today than any other one thing that could be done. Superintendents are human, like other men, and with the chances to do so they would practice favoritism more or less; and there is nothing more damaging to an organization than favoritism shown to any particular employee.

I do not agree with several of the men who have written on this subject, that efficiency is being displaced by inefficiency on our railroads; in fact, I do not believe we have ever had better service than we are now getting from all classes of employees. I distinctly remember how, a few years ago, I never expected to go to bed on pay-day nights. I had to put in my time manning crews in order to fill them, and at times was not able to fill all of the schedules. At the present time, I sometimes go three months without having a single member of a crew out of place, when called; and frequently go an entire month without administering any discipline to a single employee.

I meet with the employees and their families once each month, and all matters mutually affecting their interests and those of the company are talked over at these meetings. In other words, we make a family affair of our business, and all of us develop an interest in the work that could not be brought out in any other way.

My observation is that those who are having trouble with discipline and are being turned down by the management today are not getting out among the employees, putting themselves in the same position of the employee and seeing if they could improve on the service given by him. They are remaining in the office and "figuring everything in the sand house with the roof on and plenty of dry sand, and not giving the employee the benefit of the adverse conditions when he is out on a hill in stormy weather with a bad rail." If officers will all do this, we shall find fewer cases going to the management with a chance of being overruled.

There will be a decrease in the burdensome rules forced into the working agreement, as we all know that the executives cannot stand out against the power of the brotherhoods now, especially when we have given them the lever to force the executives.

The writer has been handling men for twenty years, during which time only two cases have been taken to the management; one in which he was sustained and the other in which he was overruled. The executive who overruled me was correct; he retained in the service a man who is working today and has made us a valued employee. I have never in my career paid one cent to any one for time lost, on account of being held out of service, or for being dismissed without just cause.

If superintendents will put themselves up-to-date and know what they are doing before they do it, it will not be necessary for them to make a "protest to the executive."

* * *

A SUPERINTENDENT'S COMMENTS ON THE "PROTEST TO EXECUTIVES"*

Van Buren, Ark.

To the Editor of the Railway Age Gazette:

Discipline is a concomitant of loyalty, and local officers, although greatly handicapped by the arrogance of some of the members and even some of the officers of the brotherhoods, can very materially improve on the present state of discipline. In his work, "Idealism in Education," Herman Harrell Horne says that the child's greatest claim on the teacher is to be understood; the same postulate holds good for the relation between the employee and the employer. It should be borne in mind, however, that the employees who belong to the brotherhoods find themselves in the difficult position of trying to serve two masters who have, in many respects, opposite viewpoints.

The younger local officers, in particular, are often inclined to be too severe and take snap judgment, and even inflict punishment with vengeance as the chief motive. They seem to have the idea that they must be doing something in the way of meting out punishment in order to make a showing. It is the case of the small mind and inexperienced. Only the larger, open mind can deal successfully with this big human problem. Unfortunately this short-sighted and consequently disastrous policy sometimes lingers with older officers, the result of indolence and failure to mingle sufficiently with the men.

Discipline is liable to suffer when a bright and vigorous young man is appointed to an official position as a result of his happening to perform some particular piece of work in a way to attract the fancy of a general officer. As a rule, a man should serve as a trainmaster a long enough time to get a good deal of experience before he is made superintendent; only thus can there be sure evidence of fitness.

Loyalty is a reciprocal proposition; therefore, the officer who deals with men at first hand must be deeply interested in them; not necessarily as a philanthropist, but as a matter of good business, because it pays. When the better element of the men on a division do not like an officer it is because, usually, he is too small for his job; because he has given little time and thought to the study of his men and still less to making himself understood. He has not progressed sufficiently in the study of human nature to realize that every man's viewpoint is governed by his own laws of thinking; that a man may have the wrong idea and be honest in his conviction, and that the big task is to get next to such a man and to bring about a mutual understanding. It is not sufficient simply to be diligent in your duties; industrious men are often very selfish men, and a selfish man cannot breed confidence. It is necessary to demonstrate every day, by all sorts of actions, that you stand for a square deal. Words count for little in this constructive work; the men are chiefly interested in what a man does. They make it their business to know what their boss does and they usually put the correct interpretation on his acts.

The most loyal men are naturally most jealous of their personal records; and an unjust suspension or a reprimand makes a lasting wound. Therefore, as a rule, a superintendent should never suspend or mark a man's record simply on the recommendation of a member of his staff. He should give the accused a chance to defend himself in a face-to-face interview, and in many cases he will find that recommendations as to discipline have been too severe. Then he has the opportunity to save (or to make) a good man for the company. Here is where the greatest value of mutual understanding comes in. Personal contact rubs off the prejudice on both sides. Explanation by letter or through a third party is not sufficient.

Following this policy, the superintendent is a busy man and at times must neglect other work; such, for example, as memorizing statistics. A man can be so engrossed in memorizing statistics and rehearsing to hold them in his mental pigeon-holes that the vital things of the here and now are neglected. The less experienced wonder at such a man's great knowledge of details as he pragmatically reels off the stuff by the yard; canned goods.

To be in position properly to demonstrate to the rank and file his good intentions the superintendent must mingle freely with his men. In this way he lays underground wires which keep him in close touch with the internal operations all the time. He must invite suggestions, and must act on them if he can; listen to grievances and take steps to correct when they are just, no matter how trivial they may seem; they may look big to the other fellow. Make it plain that you court confidence and loyalty, and will pay in kind. In short, be a teacher as well as a leader. This requires a fortitude sufficient to await the compensation in the gradual, but sure fruition in the more or less distant future.

Reinstating men dismissed as a result of demonstrated unfitness (and only such men should be dismissed) has a deadening effect on discipline. The greatest lesson a man must learn is that he must *work* to achieve! The law of compensation is inexorable.

A superintendent can be correctly judged only by general results, and by these in relation to his resources. His general standing with his men and the public is always a good index to his character. His every act is closely watched and analyzed. The interpretations thus placed on his motives make up the general sentiment which fixes his standing with his men and consequently justifies or condemns his discipline.

The eminently successful local officer, therefore, is the one who is not only working for today, but who has the prescience to see what the harvest will be tomorrow. His every act in any way connected with the handling of men is predicated on promoting confidence, the harmonizing of the countless differences and temperaments in the ranks, to the end that a new synthesis may be formed; unity out of diversity; true esprit de corps.

Loyalty, and its child, discipline, are not forthcoming on a few strokes of the pen; they are growths. What a very, very important thing then to select the proper material for local official positions, and particularly so for the ruling local position, that of superintendent, where the all-round, well-poised man is absolutely essential for the desired results.

W. C. Morse.

*See October 20, page 688, and November 3, page 806.

Manchurian Locomotives for Saigon.—The workshops of the South Manchuria Railway at Shahokon recently constructed and sent to Saigon, Cochin China, several 32-ton ten-wheel locomotives for the French railways there. It is likely more will be built.

New Locomotive Shops for the Burlington

Enlarged Facilities of Modern Design Are Being Completed for This Railroad at West Burlington, Iowa

THE extensive improvements at the West Burlington shops of the Chicago, Burlington & Quincy, which are nearing completion, and will be put into operation before the end of March, 1917, consist of a locomotive repair shop, a blacksmith shop, a steam and electric-power plant, a water storage reservoir and cooling system, several yard cranes and a system of yard tunnels.

The construction work was started in April, 1916, and it has progressed continuously and rapidly since that time in accordance with a rigid schedule, in spite of numerous obstacles of a diverse character.

The Locomotive Repair Shop

The locomotive repair shop, designed to contain the erecting and machine shops, is 792 ft. long and 310 ft. wide, measuring on the center lines of the outside columns. The erecting shop bay is of the longitudinal type, 100 ft. wide, and contains three erecting pits 30 ft. on centers and running almost the full length of the building. This entire area is served by traveling electric cranes on two levels. There are two cranes of 125 tons capacity carried on an upper runway, the trolleys of which are equipped with 15-ton auxiliary hoists for handling light material at a high hoisting speed. Two 15-ton capacity traveling electric cranes are carried on girders below the heavy crane, primarily for dismantling and assembling work on the locomotives. Entrance and exits for locomotives are provided through three doors at either end of the shop.

The machine shop bay for heavy tools is 70 ft. wide and is located parallel with and adjoining the erecting shop bay on one side. The traveling electric cranes, each of 15-tons capacity, cover the entire area of this shop. The material can be brought into the shop through a door provided in the end of the building, and can be brought up to the machine shop by the traveling electric half-gantry yard crane of 50-tons capacity which travels across the end outside of the locomotive shop. Provision has been made for suspending light jib cranes on any of the columns on either side of this shop. A standard gage railroad track extends longitudinally through the center of this heavy machine bay through doors at either end of the building. Space for light machine tools is provided in a bay 70 ft. wide parallel with and alongside the heavy machine shop.

A foreman's office is provided, which is elevated above the floor and has a liberal glass area in the walls to give a good view of the entire shop. Space for the tool room is provided beneath the foreman's office.

A bay 70-ft. wide, parallel with and along the south side of the erecting shop, provides space for repairing and storing engine trucks, stokers, steam pipes, superheaters, driver brakes, and for other work belonging to the locomotives.

The entire area of this shop is covered by a traveling electric crane of 15-tons capacity, while provision has been made for suspending light jib cranes on any of the columns on either side of this shop. A standard gage railroad track runs longitudinally through this bay and out through doors at either end.

The locomotive repair shop has a structural steel frame supported on a concrete foundation. The walls are of glazed hollow tile. The doors for the entrance and exit of locomotives are of the rolling steel type giving a clear opening 14 ft. wide by 18 ft. high. The roof consists of three-inch Douglas fir planks on fir purlins, and is covered with tar and gravel.

Ample daylight is provided in the main bay by means of a large double pitch steel skylight having an area of approximately 24,000 sq. ft. Each of the remaining three bays has a saw-tooth skylight running almost the entire length of the building. Steel sash windows manufactured by the Detroit Steel Products Company are installed, with horizontal pivoted sections for ventilation.

The Machine and Erecting Shop

Space for fans for the indirect heating system, metal lockers and toilet and lavatory facilities for the men is provided in two small additions located on the north side of the building.

The shop is heated by means of the indirect fan system, with underground concrete ducts for distributing the heated air. Tile piping is used for the smaller-sized ducts, and sheet metal outlets are carried up the side of the steel columns. The latest type of gas-filled incandescent lamps are used for artificial illumination, and plug outlets for extension lamp cords are placed liberally throughout the shop where necessary. There is a suitable system of piping for distributing high pressure steam, compressed air and water, including drinking water, throughout the shop.

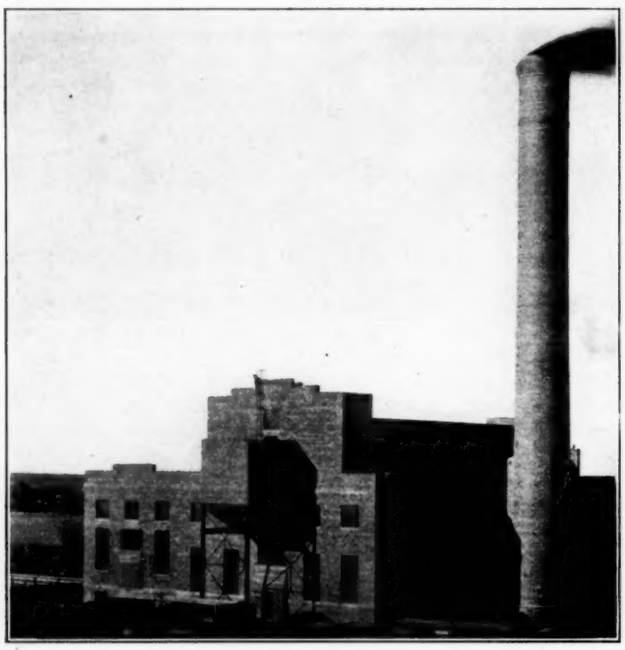
The blacksmith shop is a brick building one story high, 250 ft. long and 90 ft. wide. This building has a concrete foundation, steel columns and steel trusses, a three-inch yellow pine roof on yellow pine purlins, with tar and gravel cov-

ering. Ample lighting and ventilation are provided by a large double pitched skylight and steel sash windows.

The Power House

The power house is a brick building approximately 118 ft. by 107 ft., with a basement under both the boiler and turbine rooms. The building has a steel frame, steel sash and a reinforced concrete roof, covered with tar and gravel. Overhead coal bunkers are provided for receiving and storing coal, which is discharged by gravity into the hoppers of the stokers. Space is provided for 10 400-hp. water tube boilers, only six of which are installed at the present time. The furnaces are fired by underfed Taylor Stokers, and are designed to burn low-grade Iowa slack coal of approximately 8900 B.t.u. efficiently. The coal is unloaded by dumping into a concrete track hopper at the end of the power house, from which it is elevated by an over-lapping bucket type of elevator onto a flight conveyor, which delivers the coal through openings into the overhead bunkers. The ashes are drawn from hoppers underneath the furnaces directly into an ash car, from which they are dumped into the elevator pit, to be elevated into an overhead ash bin. From this bin they are discharged by gravity into a railroad car alongside the power house. The smokestack is of radial brick, 12 ft. in diameter and 150 ft. in height. It is connected to the boilers by steel breeching.

To promote economy in operation, the steam is generated at 160-lb. gage pressure and is then superheated 125 deg. F. by means of Foster superheaters to obtain a total temperature of about 500 deg. F. Other equipment in the boiler room includes one 4,000 hp. open-type Warren-Webster rectangu-



The Power Plant

lar cast iron feed water heater, two 12-in. by 7-in. by 12-in. Fairbanks-Morse duplex pot valve outside end packed plunger feed water pumps and one 18-in. by 10-in. by 12-in. Fairbanks-Morse Underwriters' steam fire pump having a capacity of 1,000 gal. per min.

Three steam engine-driven blowers in the boiler room basement supply the forced draft for the boilers. The two steam engines which drive the stoker mechanism are also in the basement. These boiler room auxiliaries are all operated non-condensing throughout the entire year in order to utilize their exhaust steam for heating the feed water.

The steam-driven apparatus in the turbine room is operated condensing, except when steam is needed for heating. Space is provided for three 750-kw. turbine-generators, two of which are installed at the present time. These machines were manufactured by the General Electric Company and generate current at 480-volts pressure, three phase, sixty cycles, and operate at 3,600 r.p.m. The turbines are known as the "bleeder" type, the steam after passing through the first stage having the necessary amount automatically extracted for heating and the balance passing on through the second stage of the turbines to the condenser.

Two air compressors are installed in the turbine room.

Interior of the Erecting Shop

One of these is a 17-in. and 26-in. by 26¼-in. and a 16¼-in. by 18-in. air compressor taken from the old power house. A new machine has also been installed which is an 18-in. and 36-in. by 32-in. and 20-in. by 36-in. cross-compound, two-stage high duty air compressor with a capacity of 3,200 cu. ft. of free air per min, at 110 r.p.m.

Two 200-kw. General Electric motor-generator sets consisting of 300 k.v.a. 1,200 r.p.m. 440-volt, synchonous motors direct-connected to 200 k.w. 1,200 r.p.m. 250-volt, compound-wound generators, have been installed to supply direct current for the crane motors and other direct current motors in the shops. A steam-driven and a motor-driven exciter have been installed to provide exciting current for the large generators.

The switchboard is constructed of black marine finished slate, and all apparatus, instrument cases, handles and mountings on the front of the panels are dull black finish with the exception of current-carrying parts, which are polished copper. This board was manufactured by the Westinghouse Electric & Manufacturing Company, of Pittsburgh. The turbine room is equipped with one 10-ton hand power traveling crane.

The condensing equipment is located in the basement of the turbine room. This consists of an Alberger low jet condenser, an 8-in. by 20-in. by 12-in. dry air pump, and a turbo-driven 14-in. three-impeller volute centrifugal removal pump. The water is drawn from the cooling pond by the condenser and is pumped back by the removal pump into the pond. A vacuum of 27-in. is carried.

Other Facilities

A concrete water storage reservoir, approximately 140 ft. long by 100 ft. wide and 5 ft. deep, is located about 50 ft

from the power house on the west side. The water from the condenser is cooled by means of 70 2-in. Schutte & Koerting spray nozzles. The piping between the spray pond and the power house is cast iron and laid underground.

The yard crane additions include two half-gantry electric cranes, one of 50-tons and the other of 10-tons capacity, and runways supporting one end on the locomotive shop and the other end in the yard beyond the shop building. Yard tunnels built of concrete connect the power house with the locomotive shop and the locomotive shop by an old tunnel to one of the old buildings. The main tunnel connecting the power house and the locomotive shop is approximately eight feet high and 5 feet wide and carries the pipes which contain the steam, compressed air and the returns from the heating system. The electric feeders from the power house to the main shop are also carried in this tunnel, being supported from the top of same.

This entire work was designed and constructed by Westinghouse Church Kerr & Co., of New York.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., February 27, 1917.

REORGANIZATION AND ENLARGEMENT OF INTERSTATE COMMERCE COMMISSION

The bill providing for the enlargement and administrative reorganization of the Interstate Commerce Commission, H. R. 308, was given some consideration in the Senate last week, which resulted in an amendment of its provisions in some particulars, but which also indicated that there was so much opposition on the part of the Progressives to giving President Wilson the chance to appoint two more commissioners that after about two hours of debate it was side-tracked to give way to the revenue bill. The bill, which has already been passed by the House, provides for the appointment of two additional commissioners and authorizes the commission to divide its members into as many divisions as it may deem necessary, which may be changed from time to time and to which may be referred any branch of the work of the commission, with full power to issue orders as if made by the commission as a whole. At present the commission is required to take action as a body and each commissioner feels it incumbent upon him to give at least some personal attention, even to matters of minor importance. Senator Cummins was the principal speaker in opposition to the bill, although it was understood that Senator LaFollette was prepared to make one of his long distance speeches if an effort was made to secure its passage.

Senator Cummins secured the adoption of an amendment providing that in all proceedings relating to the reasonableness of rates or to alleged discriminations, not less than three members of the commission shall sit in the hearing and participate in the decision and that in all hearings relating to the valuation of railway property not less than seven members shall sit in the hearings and participate in the decision. Senators Newlands, Robinson and Pomerene were the principal advocates of giving relief to the commission. Senator Robinson said that the commission is so crowded with its work that it will break down unless relief is afforded, and that in consequence the whole system of governmental regulation of interstate commerce might break down with it. He pointed out the large increase of work imposed upon the commission by the valuation act, the Panama Canal act and that proposed under the Clayton act, as well as the questions imposed by the car shortage situation. He said that Commissioner Clark has broken down from overwork and that at one time recently four members of the commission were in such physical condition that they were unable to work.

Senator Cummins said that he was in favor of a reorganization of the commission and that if the bill were properly amended he would place no obstacle in the way of its disposition. He thought there should be a commission of fifteen members or more and that the Newlands joint committee would propose a very much larger commission than that now proposed. His opposition seemed to be based mainly on the fear that one or two members of the commission might be allowed to decide important cases and he dwelt particularly on the danger of giving to one or two or three men the final jurisdiction to declare what the railway valuation shall be. Senator Cummins also advocated the idea of divisional or regional commissions sitting in various parts of the country, with a commission at Washington with jurisdiction to hear appeals in certain cases from the regional commissions. Several senators thought that the Cummins amendment was unnecessary, for the reason that the commission itself would wish to have the most important cases handled by a large division or by the whole commission. Senator Townsend thought that a majority of the commission would be sufficient to handle valuation matters instead of seven members, but did not oppose the plan, saying that the amendment would probably be rejected in conference. Personally, he said, he regarded the valuation subject as the least important thing with which the commission has to deal. The Cummins amendment was adopted by a vote of 60 to 5.

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CAR SHORTAGE BILL REPORTED

The House Committee on Interstate and Foreign Commerce on February 24 reported favorably, with minor amendments, the Esch bill, H. R. 20352, to give the Interstate Commerce Commission jurisdiction over car service with special powers to take summary action in case of an emergency. The report on the bill by Mr. Esch reviews the history of car shortage since 1907 with a special reference to the present situation and the facts developed by the investigation by the Interstate Commerce Commission and reports gathered by the Commission on Car Service of the American Railway Association, and strongly urges the passage of the bill, which represents the views of the Interstate Commerce Commission.

"Never before in the history of the country," the report says, "has the question of car shortage been brought so prominently to the attention not merely of the people of the country, but of Congress, as at the present time. The committee believes that this bill by giving the Interstate Commerce Commission jurisdiction as to car service will not merely greatly relieve the present situation but lessen the danger of a recurrence hereafter. Reports in the daily press of bread riots in the great cities and of coal famines in cities of several states with attendant high prices make the passage of a relief measure of this kind imperative. While high prices for the necessities of life are not wholly due to car shortage, the failure of adequate transportation facilities or lack of proper and enforcible rules for car disposition have a material effect in increasing prices. The question of car supply is, therefore, a primary one."

Reference is made to testimony presented before the committee during the last two or three years and also to the Newlands joint sub-committee in which representatives of the railroads have declared that insufficient additions have been made to railroad facilities, because of the inability to secure sufficient funds and this testimony, together with the declaration made several years ago by James J. Hill that railroads must invest over $5,000,000,000 for enlargement of facilities, is said to lead to the conclusion that the present car shortage to a considerable extent is due to the underequipment of the roads. "While it is true," the report says, "as declared by the Supreme Court, 'that it would be unreasonable to undertake to require a carrier to provide facilities which would meet every condition that might arise,' nevertheless common carriers should provide sufficient equip-

ment to take care of seasonable demands, for these are recurrent, can be anticipated with reasonable certainty and should be provided against. All efficiently managed public utilities seek to take care of the peak load, and while this may mean keeping idle part of the equipment even for the greater portion of the time, the convenience of the public must be met."

The bill extends the provisions of the act to regulate commerce to include car service, which is defined to include the exchange, interchange and return of cars used in the transportation of property by any carrier subject to the act, and the carriers are required to establish and file with the commission just and reasonable rules, regulations and practices affecting car service, which are to be filed with the commission and made subject to complaint, suspension or other orders of the commission in the same way that rate tariffs are handled. This is accomplished by inserting in the paragraph requiring the filing of tariffs the words "and any rules, regulations and practices to be established, observed and enforced by such common carrier, either individually or jointly with other carriers, with respect to car service. the compensation to be paid for use in car service for any car not owned by it and the penalties and other sanctions for non-observance of such rules, regulations and practices." Penalties for failure to comply with any direction or order with respect to car service or any regulation adopted and promulgated or any order made by the commission are provided by inserting a reference to car service in the present section of the act, which imposes a penalty of $500 for each such offense and $25 for each day of the continuance of such offense. The emergency provision of the bill, which is to take effect immediately upon passage, was printed in full in the *Railway Age Gazette* of February 9, page 222. It provides that whenever the commission shall be of the opinion that an emergency exists in respect of the supply of cars, it may suspend the operation of any or all rules, regulations or practices then established, and shall have authority to make such just and reasonable directions with respect to car service during the emergency as in its opinion will best meet the emergency. It can act in such emergency either upon complaint or upon its own initiative, and if it so orders without notice or hearing.

Representative Siegel introduced in the House on February 22 a joint resolution, H. J. Res. 379, calling upon the Interstate Commerce Commission to forthwith issue instructions prohibiting the movement of any freight for 60 days on all railroads running out of Chicago eastward bound, except foodstuffs, coal and other commodities necessary to sustain human and animal life. The resolution was referred to the Committee on Interstate and Foreign Commerce.

Senate Passes Clayton Law Extension

The joint resolution, S. J. Res. 206, extending until January 8, 1918, the effective date of section 10 of the Clayton law, which requires competitive bids on purchases by railroads under certain conditions, was favorably reported to the Senate on February 22 by the Judiciary Committee, and was passed without discussion. A similar resolution is still pending in the House and has been reported favorably. In presenting the report Senator Overman said the committee felt the law ought to be amended in some respects, but that it had been unable to give the matter proper consideration at this time and proposed the extension in order that the Newlands committee may consider what amendments to the law may be necessary.

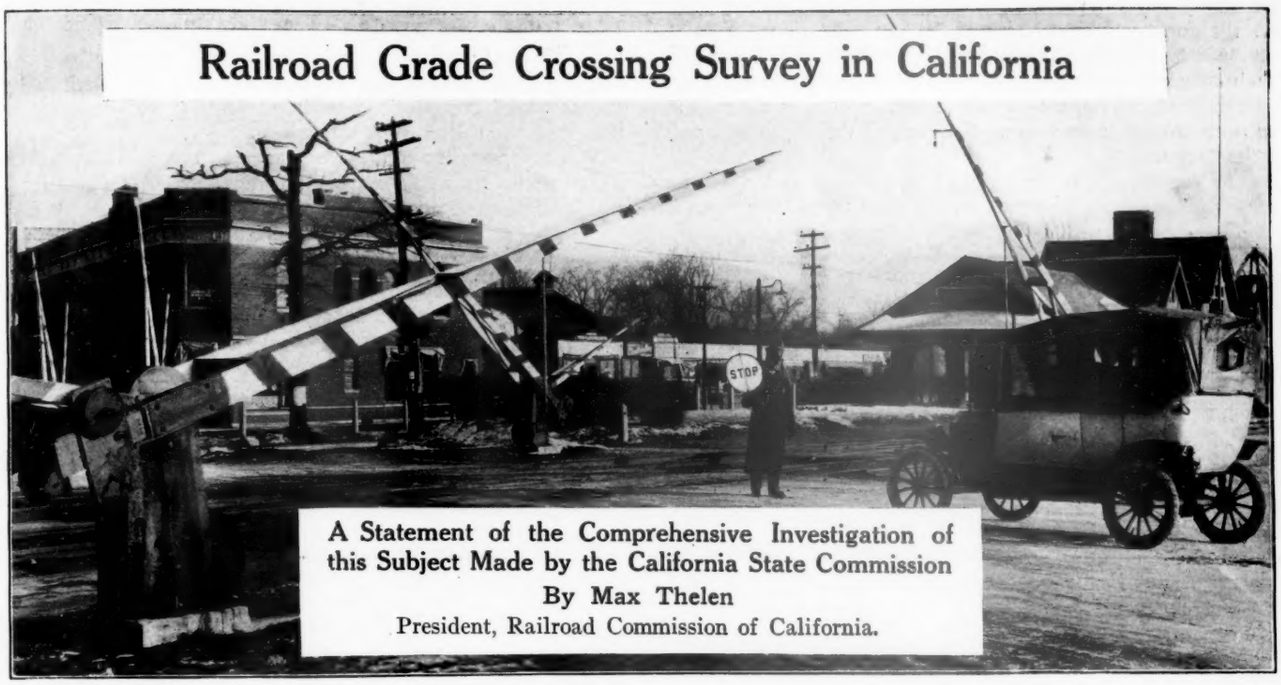
* * *

Illinois Passenger Fares

Justice Clarke of the United States Supreme Court on February 23 declined to come to the aid of the Illinois railroads in their efforts to deal with the problem created by the simultaneous existence of the Illinois two-cent fare law and an order of the Interstate Commerce Commission which became effective on January 15, prescribing 2.4 cents per mile as a reasonable basis for passenger fares between St. Louis, Mo., and Keokuk, Ia., on the one hand and points in Illinois upon the other, and directing the roads to remove the discrimination against interstate traffic. The committee of attorneys representing the Illinois railroads was given a hearing before Justice Clarke at Washington on February 20 during the recess of the Supreme Court, on their application for an order restraining the authorities of the state of Illinois from prosecuting them for violation of the Illinois law in case they disregarded it in putting into effect the order of the Interstate Commerce Commission. The application was opposed by the attorney general of Illinois, and after taking the case under advisement Justice Clarke denied the application for an injunction. The railroads had published and filed tariffs effective on January 1, establishing both interstate and intrastate passenger fares on a basis of 2.4 cents a mile. Before the effective date they also instituted proceedings in the Federal court at Chicago to prevent interference by the state by prosecutions under the drastic penalties provided by the Illinois law. On January 13 Judge Landis dismissed the bill of complaint for want of equity and held that the order of the Interstate Commerce Commission was completely beyond its power. An appeal was lodged with the United States Supreme Court and the injunction was asked pending the perfection of the appeal. In presenting the case before Justice Clarke the railroad attorneys pointed out that failure to grant the injunction would continue the chaotic condition created by the fact that appellants are subject to the order of the Interstate Commerce Commission to remove the discrimination found and at the same time are subject to prosecution under the Illinois law if they enforce the interstate tariffs. The attorney general of Illinois contended that the issuance of an injunction would not maintain the status quo pending the appeal and that the alleged chaotic condition grows out of the fact that the carriers have elected to adopt one method of attempting to comply with the order of the commission, whereas by the adoption of another method they could have entirely avoided a chaotic condition; that they have elected to attempt to enjoy the benefits of the order of the commission instead of challenging its validity. Meanwhile, the railroads are still observing the Illinois two-cent fare law, while charging 2.4 cents for the interstate fares. The Interstate Commerce Commission has not yet indicated whether it would take steps to enforce its order.

The Withdrawal of Sleeping Cars.—We doubt whether sleeping cars in this country are a paying proposition, owing to the low supplements charged, although they undoubtedly are on the Continent and in the United States. The most modern of the English cars weighs 42 tons and carries 10 passengers, so that, when filled with passengers, from London to Glasgow for instance, the companies used, before the sleeping-berth charges were raised a few weeks ago, to draw only an extra £5 ($24) for hauling a car 16,800 ton-miles. Opposed to this is the ordinary first-class coach, similar to those on the 2 p. m. Euston to Glasgow, which will seat 48 passengers for its 42 tons. One will see the withdrawal of sleeping cars—should the New Year find that brought about—with much regret. They furnish a decided boon to the busy man who, thanks to good British track and rolling-stock, can get a good night's rest in them, but if less travel can only be brought about by making it inconvenient then some reduction will be effected by the withdrawal of sleeping cars. On December 31 last there were 150 sleeping cars, of which 53 were East-Coast joint stock, 46 the London & North-Western, 23 Midland, 14 Great Western, 12 Caledonian and 2 Highland.—*Railway Gazette, London.*

Railroad Grade Crossing Survey in California



A Statement of the Comprehensive Investigation of this Subject Made by the California State Commission

By Max Thelen

President, Railroad Commission of California.

THE Railroad Commission of California is now engaged in making an investigation into each of the 10,000 railroad grade crossings in the state and in taking such action as seems appropriate, with reference to each such crossing, to promote the safety of the general public and of the railroad passengers and employees.

When this investigation shall have been completed, the Railroad Commission of California hopes that such action as is reasonably necessary and practicable will have been taken to safeguard each railroad crossing in the state which may be continued at grade, and that a further constructive program for the gradual elimination or separation of all the more dangerous railroad grade crossings will have been formulated and carried forward.

Jurisdiction of Railroad Commission

By the terms of Section 43 of the Public Utilities Act of California, the Railroad Commission has jurisdiction over the installation, maintenance, operation, separation and elimination of all crossings of railroads by railroads, of street railroads by street railroads, of railroads by street railroads and vice versa, and of railroads by public streets and highways and vice versa. No new railroad crossing may be constructed unless the Railroad Commission's authorization has first been secured. The Commission has ample power to make all necessary orders to promote safety at all railroad crossings at grade. It also has power to order a separation of grades at all railroad crossings, to prescribe the terms and conditions of such separation and to prescribe the portion of the expense thereof to be borne by the railroad or street railroad and by the state, county, municipality or other public authority in interest.

A case involving the jurisdiction of the Commission and of certain of the cities of the state, respectively, over railroad grade crossings is now pending before the Supreme Court of California. This case arose from the desire of a number of civic organizations in Los Angeles that the Commission make a comprehensive survey of the entire railroad crossing situation in Los Angeles, eliminate crossings at grade wherever possible and direct the Southern Pacific, the Santa Fe and the Los Angeles & Salt Lake to erect union passenger and freight stations.

Making the Survey

The beginning of the Railroad Commission's survey was made by the publication, by the Commission, in January, 1916, of a "general program," in which the Commission outlined the general railroad crossing situation in California, set forth the various constructive steps which it proposed to take in its state-wide survey and asked the assistance of all interested parties in the work. A copy of this "general program" was sent to the officials of each city, town and county in the state; to each railroad and street railroad; to each automobile association, and to other interested parties.

In March, 1916, public hearings were held by the Commission en banc in Sacramento, Fresno, San Diego, Los Angeles and San Francisco. These hearings were largely attended by representatives of the public and of the railroads. The consummation of the Commission's program was started at these hearings with enthusiasm and a determination to produce constructive results.

Methods of Making Survey

Shortly after these hearings were held, the Commission instructed its engineering department to commence an inspection on the ground of all railroad crossings in the state. This work has been in progress for approximately nine months, under the direction of Richard Sachse, chief engineer, and H. G. Butler, assistant chief engineer.

Insofar as possible, the field work is being done by political subdivisions, such as counties, cities and towns, and by railroads, separately, so that each report covers one or more crossings of a single railroad in a particular political subdivision. An assistant engineer of the Commission inspects each crossing on the ground, makes a sketch of the crossing and makes notes on all factors bearing on the safety of the crossing, which notes are embodied in a standard form of report, a copy of which is presented herewith.

The inspections are made, whenever possible, in company with representatives of the county, city or town and of the railroad affected. A number of counties have supplied automobiles and drivers. In other instances, the inspection is made from a track motor car supplied by the railroad.

When the notes on the crossings in a particular territory have been completed, the assistant engineer prepares a report,

which embodies the salient features of the crossings, as shown on the forms, together with his recommendations as to the action which should be taken in the interest of safety at each crossing, an estimate of the cost of the work and a suggestion with reference to a fair apportionment of the expense in cases in which some apportionment of the expense appears to be proper.

The reports are made as brief as possible and the information is given in statement rather than in tabular form, so as to be readable to all interested parties. For convenience in filing and reference, each report is given a number and each crossing in the report is also numbered. The local name of the crossing is given, if it has one. Each report contains a general statement describing the location of the crossings included therein, the names of the persons who accompanied the Commission's assistant engineer and other pertinent preliminary information. Then follows a discussion of the facts in connection with each crossing and the recommendation, if any. The report concludes with a recapitulation of the various recommendations made therein, the crossing being referred to by number and the recommendations listed under the names of the public or railroad officials, to whose attention they are called.

When reports containing recommendations have been completed and approved, they are sent out to the public authorities and to the railroads affected. The parties are asked to investigate the situation and to advise what action they will take with reference to the recommendations. If the recommendations are accepted without question, the parties are asked to advise the Railroad Commission when the recommendations have been carried into effect. If any recommendation is not approved, or if objection is made, such recommendation is reconsidered by the engineering department. If the department is still of the opinion that the work

County _____ **CALIFORNIA RAILROAD COMMISSION** *Report No.* _____

Town or City _____ *Incorporated?* _____ **ENGINEERING DEPARTMENT** *Crossing No.* _____

GRADE CROSSING INVESTIGATION *Date submitted* _____ 191

TRACK DATA	HIGHWAY DATA
Railroad company	Local name of road
Steam or electric, character of trains	Important or unimportant
Main or branch line, siding or spur	Angle with track
Location of crossing: Mile post	Grade of approaches % %
Location of crossing: Between and	Kind of road
Number of tracks	Width of approaches
Curve or tangent, apx. degrees How far?	Condition of approaches
Grade of track	Condition of road between rails
Number of trains per day	Approximate number per day of: Pedestrians
Average speed of trains miles per hour	Approximate number per day of: Teams
Distance crossing can be seen from track	Approximate number per day of: Automobiles
	Distance top of rail to natural ground line

GENERAL DATA

Distance to nearest public crossings	Crossing signs: How many? Properly located?
Distance trains can be seen at various points along highway (see sketch)	Advance signs: How many? Location
	Flagman, bells or gates: Kind
	Flagman, bells or gates: Type
Commission's observer	Date of inspection 191
Accompanied by Mr. Title	Representing
Accompanied by Mr. Title	Representing
Accompanied by Mr. Title	Representing

Remarks:

Recommendations:

(Over)

Form for Grade Crossing Investigation

should be carried out as suggested, the matter is set for a formal hearing by the Commission on its own motion. At such hearing, evidence is presented by the engineering department and by all interested parties, whereupon the Commission makes such formal order as seems appropriate.

The work is being prosecuted with the purpose of making every crossing as open to the view and as free from obstructions as possible, so that drivers of vehicles, exercising a reasonable amount of care, will have ample opportunity both to know that they are approaching railroad crossings and to see approaching trains. During the investigation, however, the fact is being borne in mind that eventually grade separations must be made at all important crossings. Accordingly, whenever it is possible for a separation of grades to be made at reasonable expense at the present time, the matter is called to the attention of the proper officials in the reports of the engineering department, even though there may be no immediate hope of securing a separation of grades.

Work to Date

Up to January 1, 1917, approximately 2,000 crossings were inspected and reported upon by the engineering department. Approximately 200 reports have been mailed to interested parties. Each report generally refers to a number of crossings. One copy of each report is sent to the officials of the county, city or town affected and two copies to the railroad, one for the general office and one for the division office. Of the reports thus sent out, 35 contained no recommendations, but the other reports contained a total of 1,100 recommendations. The following list shows the kind and number of recommendations thus far made:

To install human flagmen	4
To install automatic flagmen or bells	66
To install gates	4
To place, remove or change position of signs	449
To cut brush or trees or trim trees	319
To remove buildings, bill boards and other obstructions	30
To grade approaches	27
To change alignment of road	4
To grade between rails	14
To change grade of track	1
To close crossings	92
To separate grades	18
To change location of crossing	1
To change to private crossings	7
To operate trains at slow speed	2
Other minor recommendations	62
Total	1,100

In addition some 25 recommendations have been made for future consideration, 9 being the closing of streets, 10 the separation of grades and 6 of a minor character. Approximately 10 per cent. of the improvements recommended have been installed and an additional 70 per cent are in process of being carried out.

The cost to the Railroad Commission to date of inspection, has been approximately $2.40 per crossing. As this cost includes preliminary work applicable to the entire state-wide investigation, as well as a number of the most complicated situations in the state, the average cost per crossing will be less than this sum when the entire work has been completed.

Effect of Survey

It is as yet too early to say definitely what results have been accomplished by the investigation. During the year ending June 30, 1915, 379 people were killed or injured on grade crossings in California. During the following year, the figure was 524. From July 1, 1916, to November 30, 1916, 205 people were killed and injured on grade crossings. These last figures indicate a slight reduction in the average number of accidents which have happened during the five months during which the investigation might be expected to show definite results. The Railroad Commission, however, is convinced that this work is resulting and will result in the saving of many lives. With the very great increase in the number of automobiles in California, the enormous increase in highway traffic, and the increase in the mileage of good roads, it is impossible to say that the number of persons killed and injured in these accidents will be numerically less in the future than it has been in the past. The Commission is satisfied, however, that when the number of movements made over railroad crossings is taken into consideration—and this, of course, is the final test—the percentage of movements made across railroad crossings in California in safety will be found to be much larger than it would have been had this investigation not been undertaken by the Commission.

The Railroad Commission proposes to complete its survey of all railroad crossings in the state along the lines already worked out. Whatever can be done reasonably to make the existing crossings safe will be done. Gradually the crossings where a separation of grades should be affected will be considered in separate formal proceedings, filed where necessary by the Railroad Commission on its own initiative, the cases of greatest hazard being first considered. Contribution by the state and other public authorities toward the work of separating dangerous railroad grade crossings will be asked and the state's face will be set toward a gradual elimination of all dangerous railroad grade crossings.

The Railroad Commission has been very much gratified by the hearty co-operation which it has received from the railroads, as well as from the representatives of the cities, towns and counties. The railroad companies have questioned only a few of the several hundred recommendations thus far made to them. Except in the matter of closing streets, the public authorities have shown a like disposition to assist the Commission in every way. If this spirit of co-operation continues, the state may look forward confidently to the ultimate successful consummation of the plans for greater safety at railroad crossings now and hereafter to be formulated by the Railroad Commission of California.

MIDWESTERN MECHANICAL VALUATION COMMITTEE

A meeting of mechanical valuation department officers of railroads of the middle west, for the purpose of forming a committee on mechanical valuation, was held in Chicago on February 14. C. T. Ripley, of the Atchison, Topeka & Santa Fe, has been made chairman of the committee, and W. H. Davis, of the Chicago, Burlington & Quincy, secretary.

At present there is little uniformity of practice in mechanical valuation in the central and western districts. As each company takes up the work of mechanical valuation it is necessary for them to do research work alone, and to originate methods of organization, handling of field and office work and cost data. Each road has been obliged to take up each problem of the work and deal with it as an individual, although the same question may have been disposed of effectively by some other company in handling its work.

The companies which have finished their work are in an excellent position to assist those which have the mechanical valuation work before them. Some effort has been made to interchange information, but lack of organization has made it difficult. The purpose of the committee will be to discuss the various questions arising and extend the standardization of methods as far as possible. Sub-committees were appointed to deal with the valuation of locomotives, cars and shops, and to discuss methods of complying with Order No. 8.

Some of the subjects discussed at the first meeting were the methods of determining depreciation of locomotives, cars and machinery, scrap values, weighted averages of parts for cars and locomotives, methods of complying with Order No. 3, hidden costs in additions and betterments, material in working stocks, methods of making small tool inventory, methods of inventorying work equipment, costs of installation, costs of installing pipe lines, costs of electrical installations, costs of patterns and blue prints and costs of foundations. The various subjects discussed were assigned to the sub-committees for study.

E. B. THOMAS

E. B. Thomas, who has been president of the Lehigh Valley since 1902, has been elected chairman of the board of directors. Mr. Thomas was one of the old school of railroad presidents. He was one of the receivers of the New York, Lake Erie & Western in 1895 and first president of the successor company—the Erie—from 1895 to 1902. In 1902 the Lehigh Valley operated 1,383 miles of road and earned gross $24,272,000 and had a deficit of $1,333,000. Its operating ratio in 1902 was 81, and in 1901, 80. In the 14 years under Mr. Thomas' management the Lehigh has developed from a road on the verge of bankruptcy to one of the most sound, prosperous railroad companies of the country. In the fiscal year ended June 30, 1916, operating 1,444 miles of road, or less than 100 miles more than in 1902, the company earned $47,383,000 and had a surplus available for dividends of $7,666,000, equal to over 12 per cent. on its common stock (the Lehigh has outstanding only about $100,000 preferred stock) and paid 10 per cent. dividends on its common. It had a debit balance to its profit and loss account in 1902 of $3,372,000. It carried forward into the 1917 fiscal year a credit balance of $23,962,000. The operating ratio in 1916 was 69.84 per cent. In 1902 the average trainload was 467 tons, and in 1916, 661 tons.

In his annual report for the fiscal year ended June 30, President Thomas said: "The revenues of your company for the year under review are the greatest in its history and show a substantial increase over the preceding year. A large portion of the increased earnings has been devoted to a very liberal expenditure for the maintenance of property, particularly in the case of equipment. Your company has for years pursued the policy of discarding its old wooden freight cars as fast as they reached a condition to require heavy repairs and has condemned a great many of the same during the year. On such equipment of this type as is still serviceable, heavy expenditures have been made for steel underframes, a practice which has been pursued aggressively in the past and to a greater extent during the year just closed, as the demand for equipment increased. With the work that has been done and the work now under way, your company will have within the next few months practically no freight equipment that is not either all-steel or steel underframe."

Mr. Thomas is a veteran of the civil war and was brought up in the hard school of experience. His early activities in transportation partook of the rough-and-ready character of railroad operation in wartime, and he first became a railroad officer at a time when a superintendent's functions were much more like those of a president or a general manager than they are now. Then, as in later years, he had to be a leader of men, and, besides that, to solve many new problems without the aid of the helpful administrative machinery now available. He was appointed general manager of the Cleveland, Columbus, Cincinnati & Indianapolis, now merged in the Cleveland, Cincinnati, Chicago & St. Louis, in 1878. In 1885, he left that road to become second vice-president and general manager of the Richmond & Danville (now the Southern Railway), and also of the Georgia Pacific, now a part of the Southern.

He remained there less than three years, leaving in 1888 to become second vice-president of the New York, Lake Erie & Western, now the Erie. On December 1, 1890, he was made first vice-president. He was made president in 1894, and when the receivership was ordered he was appointed one of the receivers; and in the following year, on the termination of the receivership he was elected president of the new company, as above noted.

His management of the finances of Lehigh Valley has been eminently conservative. As an operating officer he was noted for his quick insight and his grasp of details; and he has carried these qualities into the higher offices without making the mistake of allowing details to absorb his attention.

Mr. Thomas was prominent in the American Railway Association in its early days, and has always been influential in its counsels. He never occupied the presidency of the association, which is only one of the evidences of his pronounced modesty.

E. B. Thomas

ELECTRIFICATION IN ENGLAND*

The year has been characterized by some important developments in the application of electricity to railway working. For the most part such enterprises were entered on before the war began, and though on account of scarcity of labor and materials there have been delays, most of the electrification work on hand has been completed. Early in the year electric operation began on the Manchester to Bury section of the Lancashire & Yorkshire Railway involving 22 miles of track. This is the first example in England of the use of 1,200-volt direct current with a third-rail conductor. Another important innovation which was completed during the year lies in the adoption of 1,500-volt direct current traction with overhead wire conductor for the Shildon to Newport line of the North Eastern Railway. Apart from the Holcombe Brook experimental line, this is the highest direct-current voltage yet employed for traction in England. The line also is the first purely mineral railway to be electrified in this country. It is 18 miles long, with 50 miles of track including sidings, and the locomotives can haul trains of 1,400 tons. In the latter part of 1915 the London & South Western Railway began working electrically one suburban route, and during the past year the whole of the company's suburban lines, comprising 47 route miles, came under electric operation. A third section of the electrification of the suburban lines of the London & North Western Railway was completed, and the only parts of

*From the Tramway and Railway World.

the scheme, which extends to 41 route miles, not yet worked electrically are those between Willesden and Watford and a shorter length from Euston outwards. Naturally there has been little progress on the European continent, although the Italian Government has added to the mileage of its electric railways. The conversion to electric traction of the suburban railways of Melbourne, Australia, is in progress, but it has been greatly retarded by the war conditions. In due time, however, it will become an installation that will bear comparison with the most important undertakings of the kind in Europe.

FREIGHT-CAR SITUATION IMPROVING

The following statement was issued by the Commission on Car Service of the American Railway Association at Washington on Tuesday:

"The freight congestion at Buffalo, Cincinnati, Pittsburgh, and similar interior points, has been greatly relieved in the past week, due principally to the fact that mild weather has made it possible for the roads to do more nearly a normal amount of work in the yards. Trunk line railroads, the New York Central, Erie, Baltimore & Ohio, and Pennsylvania, are making progress in sending west trains of empty cars. Special efforts are being made by the Eastern lines to supply Chicago grain shippers with enough cars to take care of their pressing needs, and to supply daily as many as 200 cars for their regular business, until more cars are available. Preference will be given at all times to domestic grain. Similar efforts are being made to take care of the grain business at Indianapolis and other cities.

"The Commission on Car Service has asked the railroads of the country to give preference at all times to shipments of foodstuffs and other supplies for domestic consumption.

"Reports received up to this date show that progress is being made in forcing freight cars to those sections where car shortage is most acute. Railroads which have a large excess of equipment will be called on for explanations as to why they have not taken steps to reduce the number of cars on their lines. Reports on accumulations of freight in cars show that in all sections of the country on February 17, the latest date for which data has been received, 168,496 loaded cars, about 6½ per cent. of all the railroad freight cars in the United States, were being held for various reasons, principally because of weather conditions and embargoes.

"Weekly reports on the accumulations of loaded cars held at various points show the following for the last month:

January 27	122,221 cars
February 3	145,667 cars
February 10	170,016 cars
February 17	168,496 cars

"The Commission on Car Service has asked the railroads to see to it that a sufficient number of cars are provided for hauling seeds for spring planting. Reports generally show an improvement in the coal situation, as far as affected by the freight car supply."

The Commission on Car Service has been holding daily sessions at Washington which have been attended by Commissioner McChord or Examiner Dow of the commission or both, and representatives of shippers from various parts of the country have appeared before it to outline the conditions affecting their industries. In each case the complaints, as well as those received by the Interstate Commerce Commission and the Commission on Car Service by wire and by mail, have been promptly investigated and action begun to relieve the conditions wherever possible. In some cases the shippers have asked that special efforts be made to furnish cars, and in other cases they have asked for relief from embargoes, and in several cases the embargoes have been modified as the conditions have made it possible. The Interstate Commerce Commission has been giving out statements showing the number of cars moved. During the 48 hours ending at midnight Sunday, 860 empty box cars were moved in full trains from Buffalo to Chicago and the West. On Friday (February 23) the commission announced that a telegram received from P. E. Crowley, vice-president of the New York Central, showed that within the 24 hours ending at midnight on February 21 that company had moved from Buffalo for the West 360 empty box cars, and on the next day 395. The telegram also announced that it was proposed to use New York Central box cars to relieve the situation at Chicago, giving preference to food supplies. Other Eastern roads have also been delivering large numbers of empty cars to their Western connections.

On Saturday the Interstate Commerce Commission gave out the following statement commending the work of the Car Service Commission:

"The attention of the Interstate Commerce Commission has been called to reports appearing in certain newspapers to the effect that the Commission on Car Service of the American Railway Association is failing in its efforts to relieve the car shortage and freight congestion.

"The Interstate Commerce Commission has confidence in the Commission on Car Service. As the authorized representatives of the railroads of the country, its members are doing excellent work in the interest of the general public, and much good is resulting from the co-operation of the railroads in their efforts to meet the present emergency."

This statement was called forth by newspaper reports attributing shortage of food to shortage of cars. This impression was created in part by telegrams sent by J. P. Griffin, president of the Chicago Board of Trade, to the Interstate Commerce Commission and to the presidents of Eastern railroads, in which Mr. Griffin criticized both the Interstate Commission and the Car Service Commission because of the arrangement, described in last week's issue, for furnishing cars for grain and flour shipments from Minneapolis, and in which he charged that the railroads were discriminating against food products. Commissioner McChord promptly replied to Mr. Griffin's telegrams, saying that many of his statements were erroneous; and the Commission on Car Service issued a statement with reference to reports in newspapers connecting freight congestion and car shortgae with the high cost of food products, in which it was pointed out that none of the embargoes which have been placed apply to food products for domestic consumption.

The statement is as follows:

"At no time has there been any shortage of cars for shipments of food stuffs generally. In no way has the increase in the cost of food been affected by a shortage of freight cars in which to haul the food. The Commission on Car Service of the American Railway Association, co-operating with the Interstate Commerce Commission, has been sitting in Washington since the latter part of November, and at no time has any complaint been received which would indicate that there was a shortage of food anywhere in the United States.

"It has been claimed that there was a depletion of the normal reserve supply of flour, and of grain for animal consumption, principally in New England. . . . In the past week upwards of a thousand cars have been sent to Minneapolis and other cities in the Northwest.

"There has not been a shortage of flour and grain as a result of freight congestion and car shortage. There is comparatively little wheat for domestic use awaiting eastbound shipment at Chicago. There is an accumulation of corn and oats, and a very large part of it is for export. There has not been any shortage of cars for shipments of dressed meats and packing house products. As a matter of fact, the packers for the most part own their own cars, and control their movement entirely. The movement of vegetables has not been affected in any way by car shortage. There has been nothing before the Commission on Car Service even men-

tioning a shortage of cars for shipments of butter, eggs, sugar, lard, onions, cabbages, chickens, coffee, rice, prunes, live stock, oatmeal, and the many other food commodities. Early in December there was a shortage of cars for moving the Maine potato crop. That emergency was taken care of through the efforts of the Commission on Car Service, and today potatoes cost about as much in Maine as they do in New York City.

"It has been the practice of all railroads to exempt from embargoes food products for domestic consumption, fuel, government shipments, and newsprint paper. To make sure, however, that no such embargoes are in effect now or may be placed later, the Commission on Car Service has today telegraphed the large railroads asking that no embargoes on food products be placed or be permitted.

"There has been a shortage of coal cars on the coal producing roads east of St. Louis and Chicago, because the coal cars had accumulated largely on Western lines. In the same way the box cars of western roads accumulated on eastern lines. The principal duty that has devolved on the Commission on Car Service has been to adopt such emergency measures as would effect a relocation of the cars, getting the coal and box cars home to their owning roads. Rules designed to bring this about have been put into effect.

"The freight congestion has been greatly relieved in the past week, owing to the mild weather that has prevailed generally. Empty cars are being moved West, where they are needed, and the situation at Pittsburgh, Buffalo, Columbus and other interior points is showing much improvement."

In his telegram to the Commission Mr. Griffin said that he wired the presidents of all Eastern lines requesting that an embargo order be issued at once prohibiting the shipment over Eastern railroads of all commodities excepting food stuffs, coal and other things necessary to sustain human and animal life, and he requested the Commission to issue such an order. Commissioner McChord in his reply denied that the Minneapolis arrangement constituted a discrimination against Chicago, and stated that the carriers had also agreed to move empty cars westbound for Chicago and the Northwest in full trains so as to protect other markets. He said that the arrangement had no reference to limiting Chicago's car supply, but, on the contrary, should have the effect of substantially increasing it. The Chicago shippers had been invited to attend the conferences at Washington on February 14 and 15, at which the arrangement was made with the Minneapolis interests, but Chicago was not represented at that meeting.

J. S. Brown, transportation manager of the Chicago Board of Trade, has been in Washington in touch with the Car Service Commission, and after a conference with him telegrams were sent to all lines entering Chicago from the East requesting them to send cars to Chicago for grain and other shipments. Western lines were also requested to send to Chicago as quickly as possible cars belonging to eastern roads for eastbound movement. According to a statement issued by the Car Service Commission, the representatives of the Chicago Board said they had been getting 200 cars a day at Chicago for eastbound grain, and wanted assurance that they would continue to get that many, but that they had shown no emergency, and that much of the grain Chicago desired to ship was for export.

The Commission on Car Service took action last week to endeavor to relieve shortage of gas coal in Iowa, Michigan, Wisconsin, Indiana and Illinois. The Commission requested all railroads to take such steps as may be necessary to facilitate the prompt handling of shipments of gas coal for use by gas companies serving the public and to give such shipments preferred handling where necessary, modifying any embargoes that might be in effect to permit them to go forward.

The movement of solid trainloads of grain and flour from Minneapolis to the eastern states in accordance with the arrangement made at the meeting in Washington on February 14 has continued under the direction of P. H. McCauley, superintendent of transportation of the Northern Pacific, and A. M. Schoyer, vice-president of the Pennsylvania Lines. For this movement eastern roads are furnishing the western roads an empty car in exchange for each loaded car furnished by the western lines.

Among the shippers that have appeared before the Car Service Commission in the past week have been representatives of the Southern Pine Association, of paper mills in the Northwest, Indiana limestone interests, cement interests and of the condensed milk industry. The condensed milk people asked relief against embargoes, and the Car Service Commission decided to issue a circular asking that cans intended for condensed milk and waybilled as such be exempt from the embargoes.

The Interstate Commerce Commission received complaints from the New York Paper and Pulp Traffic Association that paper manufacturers in New York state were unable to operate on account of the shortage in the supply of coal and pulp wood. Mr. Crowley, of the New York Central, advised the Commission that there had been a shortage of coal in northern New York due to serious weather conditions, but that the situation has been relieved and that the paper companies now have an ample supply of coal. Mr. Crowley also advised that shipments of coal were being delivered to the Boston & Maine consigned to points in Maine to relieve the situation in that state.

Representatives of the Indiana Public Service Commission and of Indianapolis grain shippers appeared before the Car Service Commission on Monday; and on Tuesday representatives of shippers of petroleum and petroleum products held a conference with the Commission. Another conference was held with shippers of fertilizers.

The Interstate Commerce Commission on Tuesday gave out the following statement received from the Commission on Car Service showing the condition of yards in the New York terminal district on the preceding day:

	Loads			Delay												
				Export			Domestic			Empties			Coal		
	Export	Domestic	Empties	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
				da.			da.								
Erie	583	1,711	1,105	90	..	..	18	..	..	..	..	..	..	..	..
Baltimore & Ohio	66	1,159	0	..	..	..	..	..	..	..	..	..	..	..	..
				da.	da.	da.	da.	da.	da.	hr.	hr.		da.	da.	
Delaware, Lack. & Western	986	346 (Coal) 137	274	144	1	12	138	1	7	36	12	..	5	1	..
New York Central	1,495	1,948	1,038	110	1	15	30	1	5	..	..	..	..	..	..
Bush Terminal	9	486	37	..	..	..	58	1	6	..	..	..	..	..	..
Brooklyn	*	524	48	..	..	..	27	..	5	..	..	..	..	..	..
				da.	hr.	da.	da.	hr.	da.	hr.	hr.	hr.			
Pennsylvania	864	1,280	1,170	114	12	6	7	12	2	48	4	24	..	..	..
				da.	da.	da.	da.	da.	da.						
Lehigh Valley	811	738	265	111	1	6.2	87	1	4	..	..	1	..	..	..
Central of New Jersey	291	234	343	33	1	10.3	32	1	5.9	..	..	..	..	..	..
Long Island	3	788	209	3	3	3	56	1	3.34	..	..	..	..	..	..
New York, Ontario & Western	15	7	45	14	1	1.6	9	1	2.8	..	..	..	..	..	..
Totals	5,123	9,352	4,534	..	..	..	..	..	..	..	..	..	..	..	..

Some of the Conditions Which the Railroads Face*

The Pennsylvania With the Freight Rates of Government-Owned European Roads Could Pay 40 Per Cent Dividends

By A. J. County
Vice-President in Charge of Accounting, Pennsylvania Railroad.

GOOD citizenship is beginning to display a healthy interest in the affairs of the common carriers. We are no longer asked what laws will curb the railroads, but what is their condition and how they can be helped. We are asked what result is the country getting for the heavy expenditures incurred for public regulation? We are asked why the railroads are constructing so little new mileage; why there is a scarcity of cars; why there is congestion of freight; why there is lack of facilities?

In short, are the railroads in a state of preparedness and is their credit sound?

My answer to this latter question is: "No; because of three barriers which I will consider later."

Citizens recognize that the railroads are owned by the people and their institutions; that they are about the heaviest taxpayers and largest consumers of all kinds of material; that they are the largest employers of labor; that they pay the highest wages of any great national systems in the world, and that they have the lowest freight rates; that they perform the most economical public service with the lowest capitalization per mile of the railroads of any country on earth.

Would Government Ownership Pay?

Citizens appreciate that were the freight rates of this country on a parity with those charged on the most successful national systems in Europe, and were the same wages paid to railroad employees here as are paid on any government or privately owned railroads elsewhere, our railroads could afford to carry passengers for nothing, could pay much larger dividends and taxes, and would still be in a very much stronger financial condition in every respect.

Give the Pennsylvania Railroad the average freight rates charged by the government-owned German and French lines, and this company could pay American wages to its employees, war prices for all its materials, and 40 per cent a year dividends to its stockholders!

That is government ownership worked out in practice. Does good citizenship demand it in this country?

Good citizenship demands that the railroads be kept in the strongest possible condition to serve the country in war or peace. It recognizes that their trained organization is the first available arm of the country in any national emergency or peril, and that the railroads are at the immediate call of the nation.

Were that call made today, it would be found that railroads are, "First in the thoughts of their countrymen!"

Three Barriers to Railroad Preparedness

But are our railroads today in an effective condition to serve the country and its industries in peace or war, and is their credit sufficiently strong to keep them in that condition?

They have, in my judgment, three barriers to cross that will require the most impartial statesmanship and the best administrative experience.

First, they must get larger earnings, and thus place their credit on a sound basis to meet the increasing costs of materials, wages and taxes, and especially to attract the new capital needed to expand their facilities and equipment.

Second, they must find a means whereby neither the companies nor their employees can stop the transportation service of the country, and whereby all differences as to wages and working conditions can be settled without bringing suffering and loss to the general body of citizens and to the business of the nation.

Third, means must be found to remove the obstacle of confusing and conflicting laws and regulations of the various states and the Federal government. This must be brought about either by co-operation between the states, or through some other method by which wasteful laws and limitations on interstate traffic, and on the earnings and credit of interstate carriers, may be removed; or by which the national government may be brought in to relieve the railroads from their embarrassment and uncertainty.

As to the first obstacle affecting railroad earnings and credit, the results for 1916 no doubt appear moderately gratifying because equipment, tracks and facilities were fully occupied. Net earnings last year, it must be conceded, made a favorable comparison with those of 1914 and other years of depression. The advance report of the Interstate Commerce Commission for 1916 shows the railroads had net operating income of over a billion dollars. Quickly flashed over the country, the mere recital of these figures created the erroneous impression that the railroads were rolling in wealth. Since then, however, the returns from the industrial companies, with the increased wages and the far higher dividends they have paid, have showed how very modest was the share of the railroads in the general prosperity. In the matter of profits they have been the merest of amateurs during this war boom!

The railroads are gratified by the business activity of the country, but desire to share to some reasonable extent in the profits of the industries which they are helping to create. That is a fair proposition.

With regard to railroad statistics, a friend of mine warned me always to heed the injunction that is found on passenger ticket coupons—"void if detached." Applied to the billion dollars alleged to be "net income," we find it was really not profit at all, and, therefore, when detached from the question of what return it represented on the money invested in the railroads and equipment, that billion of dollars conveyed no meaning. Yet the same report of the Interstate Commerce Commission showed how small the return represented by that billion dollars really was on the actual investment in the railroad properties, but the fact did not strike the imagination of the public at all.

These magnificent billion-dollar earnings yielded just six and three-tenths per cent on the property investment in railroads and equipment in the most active year in the history of American railroading.

Watered stock could not enter into this question at all, because this return is not on the capitalization, but on the money actually put into the property.

With earnings such as these, in the greatest year of activity, I ask you to judge whether the railroad outlook is sound when you consider that this represents the full return from the output of the railroads in their most useful period, earned after the most continuous and concerted effort to enforce economies and increase efficiency. We made record car-loading and record train-loads; we have put into use larger locomotives equipped with superheaters; we have rebuilt and

*An address delivered February 8, 1917, at a banquet given by the Camden, N. J., board of trade to Mr. Wilbur F. Rose.

enlarged important terminals; we have reduced grades; we have eliminated curvature. And to what purpose? To earn the maximum of six and three-tenths per cent!

This might be good enough for periods of depression, but surely not for a period of unparalleled prosperity and record business activity.

Until this situation is remedied and the railroads produce a materially increased return, it will be impossible to place them in condition to do their full duty by the public and the country. The railroads of this country have neither the profits nor the credit to keep up with, much less in advance of, the commercial requirements of the nation.

You ask what is the cause for this condition and how can it be remedied? The same illuminating report of the commission, I think, gives the best answer. The average freight revenue per ton mile declined from nine mills in 1891 to seven and three-tenths mills in 1915, or about 19 per cent. In the same period, the purchasing power of money, in property, materials and labor has greatly lessened. Taxes and regulatory laws have increased expenses tremendously, taxes alone having risen from thirty-three millions of dollars in 1891 to one hundred and thirty-nine millions of dollars in 1915, an increase of 321 per cent and the taxes for 1917 compared with 1916 will show a further increase. Meanwhile, the standards of railroad wages, material costs, equipment and stations are very much higher.

This proposition of transporting a ton of freight more than five miles—involving a service which includes the use of tracks and costly terminals—in order to earn a profit of one cent, constitutes a situation that must be remedied if the true interests of commerce in this country are to be considered.

Fruits of Ruinous Competition

No spirit of philanthropy caused this downward tendency in freight rates, but it resulted from efforts to develop additional industries and markets, and from many years of unrestricted and ruinous railroad competition. Our federal and state rate-making bodies have never fully realized the reasons for these low rates, nor have they approved of increases in rates sufficient to support the higher living costs of the railroads.

The railroads, under public regulation, have been removed from the usual market conditions of the manufacturer, who fixes his prices and output on the basis of his costs and the laws of supply and demand, and adjusts his operations accordingly.

The railroads must pay these prevailing prices, but instead of being able to increase freight rates in such periods of prosperity, when the industries of the country can afford to meet them, the railroads must wait until their situation is so weak that the right to increase their charges cannot be denied.

Then, unfortunately, the industries, themselves, are in no condition to pay such increased rates cheerfully.

The great lack of our present system of public regulation by the state and federal governments is that there is no single responsible body to remedy this situation by prompt constructive action.

Such is the penalty we pay for regulation by forty-eight diversified sets of laws and masters.

Prevention of Strikes and Lockouts

The second problem concerning the railroads is the recurring controversies with their employees. This feature is responsible for a great deal of uncertainty in the railroad field. How can the great gulf between railroad employees and their employers be bridged to the satisfaction of the country? Little is heard nowadays about the great railroad strike that threatened a few months ago, but the menace has never been adequately provided against.

The question of the proper settlement of differences between railroads and their employees regarding wages and working hours and conditions is probably one of the most vitally important matters now before the Supreme Court and Congress.

The relations of one and one-quarter million employees to the rest of the country, and the regulation of wages with fairness to all grades of the service, without paralyzing the industry of the country and inflicting want and suffering, especially on the families of the working people, as well as upon all business enterprises, will require courageous statesmanship.

The efforts of the President to have laws enacted which will prevent future strikes or lockouts until all differences between the railroads and their employees are first laid before the public for review and arbitration are worthy of universal and earnest support.

As the laws, federal and state, as well as the public welfare, require the railroad companies to render a continuous transportation service, it should be equally obligatory upon everyone concerned to refrain from disruption of that service.

It is clear to me that the Interstate Commerce Commission, already overburdened with the regulation of rates and tariffs, safety appliance laws, hours of service laws, railroad valuation, uniform accounting, car distribution, and other features, cannot undertake the further responsibility of railroad wage regulation and the adjustment of differences in working conditions, but it should, as a matter of duty, recognize the status of these matters when they affect the question of railroad rates and credit.

In my judgment the railroad situation will never be satisfactorily settled unless railroad employees and railroad managers get together and loyally support each other. Until that is done the disadvantage of a divided house will keep the railroads a favorite political football.

Conflicting Regulation

The third obstacle confronting the railroads is the numerous conflicting and inconsistent state laws and regulations, and the clash of these with federal authority. This condition affects the carriers from the time of their incorporation, and subjects practically every element in the transportation service, from such matters as the weight of locomotive bells and the use or the nonuse of cuspidors, screens, etc., to the most minute and unrelated administrative requirements.

Many of these astonishing inconsistencies are such as would cause a pessimist to smile, as long as he does not have to pay the bill. There is no humor, however, in the serious question of 48 regulators of railway rates, when not more than 10 per cent of the traffic is state traffic.

I do not believe the present efficient and able management of the railroads is on trial, but I am most deeply convinced that what is on trial is the present regulatory system, which tends to waste and inefficiency. This is the thing that is disparaging the whole system of public regulation of railroads.

These divergent laws and policies of the various states must be enforced by the state commissions. It is the system and not the state commissioners which must be blamed for the gradually increasing cost of operating railroad systems, with no one responsible for the net results.

These laws must be harmonized so that railroad development will be pressed forward. Therefore, one of the first remedies the railroads feel should be applied to cure their present unsettled condition is to place the entire system of regulation of the interstate carriers under one federal body controlling all rates affecting interstate transportation and commerce.

Such a federal body should be aided and supplemented by regional or district commissions so that the needs of the various parts of the country will be properly considered.

The central body should have power to prescribe minimum as well as maximum rates. Rate suspensions, in the interest of business and railroads, should not exceed sixty days, so that uncertainties of industries and carriers concerning rates may be of the shortest duration.

This body must be empowered by law to see either that the railroads have a free hand to make rates in accordance with commercial conditions, or, if the commission is to make the rates, that they are sufficient to produce an adequate return, not only on the enormous capital already invested in the railroads and equipment, but to give a basis for raising new capital to provide adequate facilities for taking care of increasing needs.

The railroad program also recognizes that there must be federal supervision over the issuance of railroad securities to take the place of the present diversified state regulation. There should be uniform laws as to the promotion, construction, financing, leasing and merger of railroads so that the larger interstate carriers can fully develop the territory through which they run. The day of building small branch lines by independent companies is over, because it is rarely that the smaller lines can be self-supporting.

Such smaller lines must be linked with adjoining interstate systems. It is hard to realize that many railroad companies in the State of Pennsylvania today have not the legal power to build the branches which are so urgently needed. The existing companies are, therefore, obliged to form new companies for that special purpose, and this involves needless waste in organization and administrative efficiency.

It is also equally difficult to appreciate that the laws of New Jersey permit a railroad to take a width of one hundred feet for the running tracks of its line, but that when we reach the border of Pennsylvania, a narrower width is specified. In many other respects, also, the methods of company formation, financing, leasing, etc., are radically different in these two adjoining states through which so many important lines of interstate railroads pass.

I could enlarge upon this by pointing out the differences as to extra crew laws, limitations on financing, etc. I think, however, that I have said enough to show that the difficulties attending our efforts to secure a more responsible source of public regulation, because of diverse state policies, are very serious.

Now, when we consider that a state's decision on rates affects the destinies of other states—for after all ninety per cent of the total traffic is not state but interstate—I think the conclusion is logical and inevitable that the situation must be taken in hand by a national body, acting for all the states.

National Charters Needed for Our Interstate Carriers

The reasons which I have set forth tell why the managements of so many railroads believe that a real cure for the present irresponsible and wasteful system of railroad regulation and control cannot be effected except by federal charters for all interstate carriers. This proposed change is now on the program for discussion before the Newlands committee of Congress.

There would still be left a wide field of public service for the states to regulate, such as the hundreds of public utilities exercising purely state functions, and the police and health matters affecting railroads, etc. These would give the state commissions enough not merely to justify their existence, but to place them among the most useful bodies in their respective commonwealths.

These questions affecting the railroads will come before the congressional committee of inquiry, which was appointed as a result of the President's recommendation, and we ask the full support of the country for that inquiry.

Wages and rates must, I believe, force themselves upon the country for solution before that Congressional inquiry is able to complete its task.

Railroads Suffering from Growing Pains, Not Decline

However, in spite of all I have said, take no gloomy view of the railroads. They are suffering from growing pains and not from decline. They want to furnish adequate transportation and will respond to the proper prescription.

No measures short of concentrated federal regulation will afford a permanent solution that will sustain the credit of the railroads, and thus enable them satisfactorily to meet the requirements of the public service. Such a system of national regulation, properly worked out, will permit the railroads continuously to attract the additional capital necessary for the construction of new mileage, the new equipment and the large terminals now so urgently needed. It will also make it possible for the railroads once more to lead the country in the path of prosperity, and to maintain their position as reliable investments for the savings of our citizens and institutions.

SLAG AS A CONCRETE AGGREGATE*

By Sanford E. Thompson.
Consulting Engineer, Boston, Mass.

The relatively high strength of slag concrete is well known, but few tests have been made to compare the relative value of different slags and to study comprehensively the various qualities.

The problems requiring research included: (a) the use of slag for plain and for reinforced concrete: (b) the relative value of slag vs. gravel for building construction; (c) the relative characteristics of slag made from different processes; (d) the relative value of the same slag under different conditions of age, size and porosity; (e) the strength of slag concrete with the permissible proportions and stresses to adopt, and (f) the durability of slag concrete.

To treat these various questions properly, several series of tests were undertaken.

Summary

The results of the tests may be summarized as follows: (1) The strength of concrete made with slag, such as is obtainable commercially in eastern and northern Ohio, was on the average about 50 per cent higher at the age of 28 days than gravel concrete made with first-class materials. (2) Using the same proportions by volume as for gravel concrete, about 15 per cent more cement on the average was required per cubic yard for slag concrete than for gravel concrete of the same proportions. (3) No authentic cases of deterioration of slag concrete made with Portland cement or of rusting of steel embedded in such concrete have been discovered. (4) Porous slag produced a concrete of substantially the same strength at 28 days as dense slag. At later ages, the dense slag is probably stronger. (5) Slag made by different processes and under different conditions showed no marked difference in strength and other characteristics. (6) An extremely hard. dense, acid slag did not produce a concrete of greater strength than porous, basic slag on a 28-day test. (7) The weight of the slag concrete tested averaged about 6 per cent lighter than an average gravel concrete. On the other hand, very dense acid slag concrete was heavier than gravel concrete. (8) Granulated slag produced a mortar of inferior tensile strength on short time tests. (9) Crushed slag screenings produced a mortar appreciably higher in strength than standard sand mortar.

No tests of water tightness of slag concrete have been made

* Abstracted from a paper presented before the American Concrete Institute Convention at Chicago February 8, 1917. It represents a portion of a report made for Stone & Webster Engineering Corporation, New York.

in this series, nor of the protection of metal. Tests by other authorities and examinations of structures of slag concrete and tests made with concrete of other aggregates show that when properly laid the steel is protected from rust, although the aggregate is porous.

Tests thus far made of the permeability of slag concrete are insufficient to determine its availability for thin watertight work, such as tanks. The weathering qualities of slag concrete are indicated as satisfactory by an examination of structures which have been built for a number of years, but further experimental investigations along these lines with different types of slag are needed before the conclusions as to its use can be considered final.

Specifications for Use of Slag for Concrete

The tests have not been extended over a long enough period to warrant a final recommendation for specifications. It appears from the results thus far obtained that for practical construction: Slag must be air-cooled, crushed, screened from dust and free from foreign material. The weight of screened slag when shaken to refusal should not be less than 65 lb. per cu. ft. On account of the nature of the slag, exceptional care must be used in proportioning, mixing and placing, especially where concrete is chuted, to insure a uniform dense mix.

The normal composition of commercial slags is given in one of the following paragraphs and it is suggested for the present that slags not falling within the limits there given be rejected. Commercial practice requires that slags which are low in magnesia (say 1 to 2 per cent) be seasoned in banks for at least six months. Slags of higher magnesian content (say 5 to 6 per cent) appear to require a much shorter period of seasoning.

Strength of Slag and Gravel Concrete

A series of comparative tests was made of slag gravel concretes, using the same sand in each for the fine aggregates. The slags were commercial acid and basic slags, green basic slag and specially picked dense and porous slags.

Conclusions drawn from a study of the results are given below:

The slag concrete averages 56 per cent stronger than the gravel concrete made with the same sand. Because of more voids than in gravel a larger amount of cement is contained in a cubic yard of slag concrete than in gravel concrete of the same proportions by volume. This amounts to about 15 per cent, a greater difference than between broken stone concrete and gravel concrete, which ordinarily is not over five per cent. Assuming that the strength of similar concrete varies with the percentage of cement, the net increase in the strength of the slag over the gravel concrete is almost 36 per cent.

It was noticeable that the strength of the concrete was substantially the same whether or not the slag was porous or dense. This evidently is due to the fact that the solid part of the porous slag is very strong and that the pores are enclosed by the mortar. Inspection of the crushed specimens where breaks occurred through the pieces showed a very strong bond between the mortar and the pieces of slag. While this probably was due in part to the rough nature of the surface of the slag, it was evident from inspection that something of a chemical action had taken place between the slag and the mortar.

While these tests have not yet been carried further than the 28-day period, experiments by other authorities indicate in general a normal growth in strength of slag concrete. An exception to this is where the slag is of extremely light weight, say, 50 lb. per cu. ft., in which case, because of the low strength of this aggregate, the strength of the concrete on long-time tests does not appreciably exceed the strength of 28 days.

Stresses and Proportions

The Joint Committee on Concrete and Reinforced Concrete based the allowable working strength on the strength of concrete cylinders 28 days old. If the Joint Committee recommendations are followed, therefore, it would be permissible to use 50 per cent higher stresses with the slag concrete than with gravel concrete, or conversely, to use lean enough proportions in similar ratio. While so large a stress is not yet warranted without still more extended tests, especially as a single series is not sufficient to establish definite ratios, the results indicate that where slag is accepted for use, it is permissible to use at least 15 per cent higher stresses in the concrete than are normally adopted, or 15 per cent less cement with the same stresses. No tests of elasticity were made in the present series. A few tests made several years ago at the Watertown arsenal show about the same modulus of elasticity for slag concrete as for stone concrete of the same compressive strength, and this relation may be assumed until tests determine this point.

Other Characteristics

The chief objection to slag as a concrete aggregate has been based on the possibility of disintegration at some future time. To investigate this point, chemical and physical tests were made and several cities were visited where slag concrete had been used for a number of years. As a result of a careful examination of various structures made with slag and interviews with users of slag concrete, no evidence was found of disintegration where Portland cement was used. In certain cases with puzzolan, or slag cement, the concrete is not in first-class condition, but this is to be expected with any puzzolan cement concrete laid in air.

No tests have been made in this investigation of the protection of metal. Tests in other laboratories, however, have shown satisfactory results, and the fact that tests of cinder concrete show that it will protect metal when properly mixed and laid is evidence of the fact that slag concrete can also be depended upon when handled with proper workmanship. The appearance of broken sections of slag concrete is very dense.

No definite tests are available on the watertightness of slag concrete. As stated above, slag concrete can be accepted as protecting metal from moisture, and therefore can be considered as resisting the penetration of water. Further tests should be made before it is adopted as material for tanks or other thin structures which must be watertight.

The chemical composition of slag produced by different furnaces varies. The material which is designated as magnesian slag is apt to run about 4 to 6 per cent magnesia. The limestone slag will run about 1 to 2 per cent magnesia. The compositions of slag are ordinarily included within the following limits:

Silica	32	to	36	per cent
Alumina and iron	11	to	15	per cent
Lime	40	to	48	per cent
Magnesia	1	to	7	per cent
Sulphur	1.0	to	1.7	per cent

Slag concrete does not flow to place as readily as gravel or even broken stone concrete, and cannot be used with so large an excess of water, nor does it flow down so flat a slope. These points, however, by no means prevent its satisfactory use in construction. The very fact that it requires extra care and will not flow readily tends to prevent the making of very weak concrete such as is so frequently found with first-class aggregates which have been made with an excess of water.

Further information is desirable on long time tests of slag concrete exposed to air and to moisture to compare the relative value of porous and dense slag as an aggregate. Certain of these specimens should be ground so as to expose the aggregates to the weather. Permeability tests, tests of modulus of elasticity, and tests of expansion from changes in temperature and moisture also should be made.

Water Conditions in the Locomotive Boiler

The Boiler Itself a Laboratory Where Chemical Reactions Change the Character of the Feed Water Impurities

By George L. Fowler

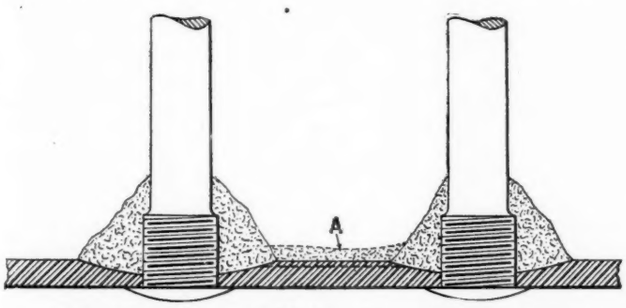
IN a recent study of boiler feed waters on a railroad afflicted with a variety of troubles, certain facts and conditions were brought to light that were new to those conducting the investigation, and they may prove of interest to others who find themselves in the same situation.

In dealing with this investigation, the general principles involved will alone be discussed, as a discussion of the remedies applied would be misleading. This will readily be understood as the development of the subject proceeds. Furthermore the several varieties of water and the methods of handling them will be described separately, as if they were different problems and had been worked out independently, although the investigations were carried on simultaneously, and the data secured at one point often threw light on the situation and suggested the treatment at another point.

The one broad and surprising development all along the line was the impossibility of placing full dependence, and sometimes of placing any dependence whatever, on the analyses of the raw water as drawn from the wayside tanks.

The waters encountered were scaling, corrosive, foaming and muddy, with a tendency to corrode in every case except the foaming.

In one case, where a well water had been used, and a treating plant established, so much trouble had been experienced from foaming that the treating plant had been closed and the water abandoned. This was due to the amount of soda that it had been necessary to add in order to free the water from the sulphite scales. The raw water carried so much of the sulphates of lime and magnesia that the soda added to precipitate them raised the alkalinity to a point where the water was too light for use.



Scale Formation and Pitting Around Crown Stays

With the abandonment of this well, recourse was had to a somewhat muddy river, the water from which was used over an entire division. Its analysis showed little variation, from point to point, the average being about as follows:

	Grains per gallon
Calcium carbonate	2.42
Calcium sulphate	1.53
Magnesium carbonate	.74
Magnesium sulphate	.88
Sodium sulphate	.15
Sodium nitrate	.07
Sodium chloride	2.29
Silica	.66
Alumina and iron oxides	.15
Organic matter	.36
Volatile matter	.44
Total	9.69

From an inspection of the analysis this water would not be considered bad except for the scale-forming ingredients, which were not excessive, and the organic matter, which might decompose and form an acid reaction. It did not cause much trouble from scale. The sheets could be kept comparatively clean, except for clusters of scale that formed to a considerable thickness about the crown sheet staybolts. The extent of these formations is indicated in the sketch.

The scale formed in this district was of medium hardness and brittleness and was easily removed from the surfaces to which it adhered by tapping it with a hammer. It would then peel off in large flakes leaving the metal clean. Where the sheets were bare or the scale thin there was no corrosion. But where the scale formed corrosion took place beneath it, forming a large pit as shown. The thicker the scale, the deeper was the pit.

Pitting of the tubes was not as bad at the front end of the boiler as at the rear, the worst condition being found about six feet ahead of the back tube sheet on tubes 19 ft. long. The corrosion was also worse on the top than on the underside of the tube.

A similar but more pronounced corrosion occurred on the crown sheet at the staybolts. Here, too, it was more pronounced under the thickest scale. The scale formed around the staybolts eccentric with them towards the side of the firebox and almost truly concentric at the center. The slow movement of the water from the side in towards the center apparently was checked by the staybolt and the greater part of the scale deposited here. Occasionally the scale would form on a line from one bolt to the next and then the corrosion would extend between the bolts thus connected, forming a wide groove from bolt to bolt.

As the water appeared harmless and the corrosion occurred only beneath the scale it was surmised that the scale might be corrosive. A sample of the scale was therefore analyzed with this result:

	Per cent
Calcium sulphate ($Ca\ SO_4$)	83.00
Calcium carbonate ($Ca\ CO_3$)	3.96
Magnesium hydroxide [$Mg\ (OH)_2$]	2.88
Silica ($Si\ O_2$)	4.09
Alumina and iron oxide ($Al_2\ FE_2\ O_6$)	2.99
Combined water and organic matter	1.64
Water driven off at 163° C.	1.09
Total	99.67

As there was nothing in this scale of itself of a corrosive nature, it would seem that after the deposition of a certain amount of scale the plates beneath it became locally overheated. This causes a decomposition of the organic matter, the calcium sulphate and the magnesium hydroxide forming free sulphuric acid which is partially protected from dilution with the boiler water and attacks the sheets.

The cure, then, lies in preventing an accumulation and adhesion of scale. A remedy was applied for this purpose. The scale already formed was broken up, the adhesion of new deposits prevented, and, up to the present time, this seems to have stopped the corrosion.

In another case there was little or no trouble from scale, but there was an intense and rapid corrosion that would destroy tubes by pitting in 9 or 10 months.

The water that was doing this did not even give an acid reaction, and though the analysis corresponded to that which was known to have a corrosive action, there was nothing to account for the intensity of the action which actually took place.

A difficulty in making a correct diagnosis of the case lay

in the known probable wide variation in the character of the water drawn from the same tank. Throughout this whole region the water was drawn from small mountain streams that received the drainage from mines and the sewage from villages, and which a sudden shower would raise to overflowing banks.

At one place where there was about 33 grains of scale forming matter to the gallon, of which nearly 30 grains were lime and magnesium sulphates, a lime and soda treating plant had been erected; the results, however, were unsatisfactory. The scale-forming content had been cut down but the soda had raised the alkalinity of the water to the foaming point and engineers had learned to avoid it if possible.

After a rather thorough examination of old analyses of the waters of the region, it was decided that something was happening in the boilers of which nothing was known. Two boilers were selected, the water of each of which had been taken from a single tank, and samples analyzed after having been in service for about eight days. The variation in the composition was startling, as shown by the following analyses:

Impurities	Grains per gallon: From tank	From boiler
Calcium carbonate	.29	...
Calcium sulphate	15.05	7.02
Magnesium sulphate	11.67	28.81
Magnesium sulphate (manganic)	...	10.61
Iron sulphate (ferric)	...	43.87
Alumina	...	45.15
Sodium sulphate	9.62	38.38
Sodium chloride	1.52	14.99
Sodium nitrate	...	.12
Silica	1.51	21.93
Alumina and iron oxide	.52	...
Organic matter	1.96	17.21
Free sulphuric acid	...	2.33
Total	42.16	230.42

The water taken from the boiler was extremely bad. The free sulphuric acid, coupled with the large quantity of organic matter, fully explain the rapid corrosion that takes place in the boiler using the raw water from which it is formed. Tubes were fitted and seams cut away in a short time so that the working of the engines became an impossibility.

Because of the uncertainty as to the uniformity of the quality of the water delivered to the boiler, an experimental investigation was instituted. A small boiler of about two gallons capacity was built, in which definite samples of water were evaporated. As first built the boiler was fitted with a gravity feed in which the water was heated before it entered the boiler, and where there was evidently some deposit of scale. The boiler was operated under a steam pressure of 200 lb. per sq. in.

The method of operation was to draw a quantity of water from the tank to be examined, and analyze it; then to take 75 gallons of the sample and evaporate it to one gallon in the small boiler. A typical result is given in the following analyses:

Impurities	Grains per gallon: Raw water from tank	Concentrated water from boiler
Calcium carbonate	1.34	.73
Calcium sulphate	...	1.91
Magnesium carbonate	.70	...
Magnesium sulphate	.17	2.76
Magnesium chloride	...	1.74
Sodium sulphate	.52	...
Sodium chloride	.70	2.11
Sodium nitrate	.07	.57
Silica	.58	5.47
Alumina and iron oxide	.29	2.64
Organic matter	.81	2.29
Total	5.18	20.24

These analyses present a good example of the change which has been found repeatedly to take place in water that has been subjected to the high pressure and temperature obtaining in a locomotive boiler.

It will be seen that while some compounds disappear others are formed. In this case the raw water contained neither calcium sulphate nor magnesium chloride and yet both were found in the water taken from the boiler. On the other hand, the sodium sulphate and magnesium carbonate disappeared. The calcium sulphate was probably formed by the decomposition of the sodium sulphate and the passage of the sulphuric acid over to the lime, while the magnesium chloride was probably formed by the decomposition of the salt in the presence of the organic matter and the taking up of the chlorine by the magnesium. The further decomposition of the magnesium chloride formed hydrochloric acid which directly attacked the sheets.

The statement as to the decomposition of common salt (sodium chloride) is thought to be novel and may be incredulously received. Salt has always been considered one of the most stable compounds that would remain unchanged, through all the vicissitudes of repeated dissolving and precipitation by evaporating. In seven cases where these evaporation tests were made, however, each showed an apparent disappearance of the salt and the formation of new compounds that did not exist in the raw water.

Though the evidence is not absolutely conclusive, this phenomenon seemed so well assured that it was considered worth while to attempt to regulate it. One of the worst of the waters was selected and subjected to the boiling test and an examination made, so that the reactions were known. The raw water was then treated with sufficient barium hydroxide to precipitate all of the sulphates as barium sulphate, at the same time, in the hope of removing or decomposing the organic matter that appeared to be giving so much trouble. Again a concentration test was made of 75 gallons of the water thus treated, with the following results:

Impurities	Grains per gallon: Treated raw water	Concentrated water
Calcium carbonate	1.11	.70
Magnesium carbonate	.11	.05
Sodium carbonate	2.45	69.18
Sodium sulphate	.58	57.87
Sodium chloride	.76	9.91
Sodium silica	...	2.63
Silica	.53	...
Alumina and iron oxide	.06	.53
Loss on ignition	.40	4.14
Total	6.00	145.01

These results show that while the elimination of the sulphates was practically accomplished the organic matter was not thoroughly removed, and that all of the sodium was retained in solution and combined with the liberated carbonic acid, some of the sulphuric acid and the silicic acid present, thus making the water strongly foaming. Had less barium hydroxide been used more sulphuric acid would have remained; had more been used free sodium hydroxide would have been found in the concentrated water. The results of this test, therefore, were disappointinng.

To effect a complete removal of the organic matter a third trial was made in which 15.5 grains of alumina in the form of aluminum cream was added. The desired end was not attained and the failure was even accentuated by the tendency to foam that developed towards the end of the test.

As these waters do not lend themselves to successful tank treatment two methods were adopted to prevent the corrosive action, both of which appear to be working successfully. One is to make an examination of the water in the boiler each day, and prescribe the amount of soda compound that is to be used. The examination requires only five to ten minutes' time and the application is made through a hose attached to the suction chamber of the injector. Enough of the compound is used to maintain the alkalinity of the water in the boiler at .3 per cent, which, while not entirely noncorrosive, is so nearly so as to avoid trouble.

The other and simpler method is to apply a corrosion inhibitive at each washout. If the boiler has been in service for some time and the corrosion has started it has been found

to require three or four applications to stop it. After that the water drawn from the boiler will be clear and free from oxides. Where this treatment is used and the water in addition to its corrosive qualities carries scale-forming matter in any quantity, it is necessary to add a scale preventative to the inhibitive.

In still another case, where the water was drawn from a territory in the immediate vicinity of iron pyrites mines, and the boiler formed a chemical laboratory that made and unmade a variety of compounds, one of the regular proprietary boiler compounds was found to possess the qualities needed to cut scale and prevent corrosion, the water flowing from the boiler clear, instead of almost blood red and filled with iron oxides, as when used without treatment.

Finally, owing to the possible error that might have crept into some of the determinations because of the pre-heating of the water before delivery to the boiler, the latter was overhauled. The heater with the gravity feed was removed and a pump substituted so that cold water was delivered to the boiler, within which it received all its heat. A condenser was also added so that all escaping steam could be collected and made available for analysis.

The water selected for the trial was one that had a bad reputation for scaling and corrosion. It was recognized as unfit for boiler purposes in any event and was made worse by being raised with an air lift, thus becoming charged with air and carbonic acid.

Evaporative tests of this water were made and they will be given in some detail to emphasize the reactions that take place in a boiler when working under the pressure and temperature involved in modern conditions of locomotive service, and to demonstrate the probability of the decomposition of the salt by removing, as far as possible, all elements of error.

The first test was made with the raw water as delivered to the tank by the air lift. As before, the boiler was cleaned prior to the beginning of the test and 75 gallons were evaporated to one gallon. The reason for the selection of 75 gallons as the quantity to be evaporated was because 75 to 1 was about the ratio evaporation occurring in the boilers in service during the periods between washouts and it was the best approximation that could be made to road conditions.

The results of the test in which the raw water was used are shown in the following analyses:

Impurities	Grains per gallon: Treated raw water	Grains per gallon: Concentrated water
Calcium carbonate	10.44	2.51
Calcium sulphate	...	48.59
Calcium chloride	...	19.71
Magnesium carbonate	3.15	...
Magnesium chloride	...	23.92
Sodium sulphate	1.45	...
Sodium nitrate	1.75	91.10
Sodium chloride	1.45	67.33
Silica	.35	.29
Alumina and iron oxide	.11	.29
Organic matter	.81	18.84
Total	19.51	272.58

The recovered sediment weighed 1,091.41 grains and with one gram taken for analysis the following results were obtained:

Calcium carbonate and sulphate	76.72 per cent
Magnesium hydroxides and carbonate	15.48 per cent
Alumina	2.36 per cent
Ferric oxide	.64 per cent
Silica	2.80 per cent
Organic matter	.84 per cent
Water	1.06 per cent
Total	99.90 per cent

The distilled water collected in the condenser contained:

Total solids per gallon	.52 grains
Ammonia per gallon	.22 grains
Chlorine per gallon	.58 grains

With this definite data in hand a similar test was made with the same water treated with enough slacked lime to precipitate the carbonates. For this purpose 66 grams (102.85 grains) of slacked lime was added to 75 gallons of water. The precipitates were allowed to settle and the water filtered before starting the test, which was conducted in the same manner as the one already detailed.

The analysis of the treated and concentrated water was as follows:

	Grains per gallon: Treated	Grains per gallon: Concentrated
Calcium carbonate	1.40	7.28
Calcium sulphate	....	7.85
Magnesium carbonate	.40	....
Magnesium chloride	....	3.09
Sodium sulphate	1.11	44.10
Sodium nitrate	1.75	108.85
Sodium chloride	1.40	63.06
Silica	.35	.35
Alumina and iron oxide	.23	.29
Total	6.44	232.87

This test is of especial interest because of the marked chemical changes that took place in both the raw and treated water under the high pressure and temperature at which the evaporation took place. The most remarkable of these changes was the disappearance of the common salt.

In the raw water the salt amounted to 1.45 grains per gallon or 108.75 grains in the 75 gallons, while but 67.33 could be accounted for in the concentrated water and none in the sludge, a loss of 41.42 grains or more than 38 per cent. At the same time the total organic matter in the 75 gallons was 60.75 grains and but 19.68 grains is accounted for in the concentrated water and sludge. Again there was a total of 236.25 grains of magnesium carbonate in the raw water of which none appeared in the concentrated water and but 15.46 grains in the sludge together with the magnesium hydroxide. Finally of the 131.25 grains of sodium nitrate that was in the raw water, there was but 91.10 grains in the concentrated water, making a loss of 40.15 grains or about 30.5 per cent. The losses for carbonates are accounted for by precipitation.

On the other hand, there was no magnesium chloride or sodium sulphate in the raw water, while there was 19.71 grains of the former and 48.59 grains of the latter in the concentrated water. These compounds must have been built up by the decomposition of other compounds in the raw water.

Attention has already been called to the fact that common salt is one of the most stable of compounds and that it has been considered impossible to decompose or break it down by boiling the water in which it is dissolved, even though carried to the point of saturation with the consequent precipitation. The writer, however, is not aware that investigations have been made as to the effects of the high pressure and temperature obtaining in these tests. The loss of the salt may be accounted for by the breaking down of the organic matter present.

We have seen that there was a decided loss of organic matter and also the development of some ammonia and free chlorine. It is well known that ammonia has a greater affinity for chlorine than has sodium, while magnesium follows closely after sodium. Hence, when the organic matter contained in the water has decomposed with the release of ammonia, the latter attacked the salt and broke it down by robbing it of its chlorine.

The appearance of magnesium chloride in the concentrated water fully explains the corrosive action, for it is broken down with comparative ease and converted into hydrochloric acid that will make a direct attack on the sheets.

The same chemical changes, but of different quantitative values occurred in the tests of the lime-treated water. With this there was no apparent corrosion. This probably may be explained on the basis of a much smaller development of magnesium chloride, thus diluting the corresponding amount of hydrochloric acid developed to such an extent as to render it harmless. The air, too, that was contained in the raw

water probably had a direct influence in promoting some of the changes that took place, especially in furnishing the oxygen for the formation of the magnesium hydroxide found in the residue.

The removal of this air by the lime treatment apparently prevented that formation from occurring in the second test and so made the water suitable for boiler purposes.

These investigations have been discussed in considerable detail because, so far as known, it is the first time that the solution of water difficulties has been approached in this way.

The difficulty of explaining phenomena of daily occurrence from analyses of the raw water alone indicated the possibility of chemical action within the boiler and the developments seem to have demonstrated that the boiler of a modern locomotive is a chemical laboratory of almost infinite possibilities. The tests suggest that many of the unsatisfactory results obtained from the use of proprietary compounds have been due to a failure to adapt them to this condition.

The results of the investigation have served to convince those engaged in it that there is no cure-all for boiler troubles, and that the individual remedy must be found for each local or regional trouble. Whatever the trouble may be, an effective remedy can be found if the problem is attacked with a proper spirit of patience and thoroughness and the reactions of the water under working conditions determined. It is well to make a careful diagnosis of the disease before prescribing a remedy.

BOX CAR EQUALIZATION

By A Car-Service Man.

The amended car service and per diem rules of the American Railway Association, which have just been adopted and which require the return of cars to owners with absolute respect to the rights of ownership, are uneconomical and impossible of accomplishment, in their application to box cars, except at a prohibitive expense. If these rules are complied with by railroads generally in their application to box cars, it will result in a decrease in the number of box cars available for railroad service. At a time such as the present, when the demands for transportation facilities are at a maximum and beyond the ability of the carriers to supply, consideration should not be given to methods which will decrease the efficiency of the present supply. The thing to do is to induce maximum efficiency, even though this should require the abandonment of obsolete practices, which, in times past, may have been considered entirely feasible, but which, in the light of present changed conditions and maximum demands, are not adequate.

There is no question that, provided the demands for freight cars continue in the proportion which obtains to-day, after a few months' endeavor to observe the rules, this practice will have created such tremendous operating expenses and such decreased car efficiency, that the requirements for compliance with the rules (in so far as they apply to box cars) will be abrogated. We shall be forced to it. Some other method which will insure to car owners a supply of cars commensurate with the number which they have placed in service will be substituted.

The fact that interchange rules which recognize the initials appearing on a car are practically inoperable was demonstrated by testimony submitted before the Interstate Commerce Commission both by railroad managers and by shippers. Any attempt to absolutely respect the prescribed rules for box cars would work a hardship upon the industrial and commercial business of the country, and would virtually create a cataclysm. In fact, the testimony presented indicated that placing the rules in force, with no power of discretion for their waivure, would result in paralysis of business. In connection with the coke industry in Detroit, it was testified that the absolute enforcement of the rules would seriously interfere with the proper living facilities of a main portion of the population of that city. The situation in New York Harbor is another instance where the rules will be impossible of enforcement. A snowstorm over a wide area, with its retarding effect upon transportation efficiency, will also create conditions making the enforcement of the rules impossible, so far as box cars are concerned. Likewise, an insistence upon absolute obedience to the rules at large manufacturing industries will seriously interfere with the economy of their operation; which is a vital factor in the commercial development of the nation.

Since the adoption, originally, of rules governing the return of cars to owners, the two extremes of car shortage and car surplus have been experienced. In periods of car shortage, cars have been handled as though they were pooled, but without regulation and with no regard to the number of cars contributed to the general car equipment of the country by the individual railroads involved. In periods of car surplus the letter of the rules has been more strictly observed, with the attendant result of abnormal expense in the haulage of empty cars returned to owners when, because of slack business, the returns from railroad operations generally have been insufficient to meet the abnormal expenses thus created. And we all know of roads which have had instructions in effect, during times of car surplus, that, as much as possible, foreign cars should be returned to their owners empty, and that loads should be placed in system cars for delivery to foreign roads. That is to say, send the other fellow's cars home, and at the same time, make him pay for the use of yours; and thus creating empty mileage for both roads involved.

The need to-day is for a plan which would permit of the utilization of freight car equipment to its maximum, at minimum operating expense, and which would insure to the car owner his proper proportion of cars; in other words, a car equalization plan. Car pools have been proposed repeatedly in the past, as every reader of the *Railway Age Gazette* knows, and the obstacles to the effective operation of a pool have scared us all off. But the subject cannot be killed by neglecting it; it is still a live problem. The business of the country is all the time growing, and the problem not only survives but grows constantly more pressing. Lest we forget its importance, let attention be given at this time to the

Essentials of a Car Equalization Plan

(a) The establishment by the railroads of a holding company, acting under the direction of the American Railway Association, which shall be empowered to purchase or lease car equipment, to be operated by a commissioner and proper committees to be appointed by the American Railway Association.

(b) Establishment of a formula for determining the number of box cars which each road should contribute to the general box car equipment of the country, such formula to be based upon the average number of box cars on line of each carrier member of the pool, proper allowance to be made for car shortages and car surpluses which may have existed during such period for which car location statistics are prepared.

(c) All box cars which conform to the standards laid down by the commission to be admitted to the pool, recognition being given to the variation in age, design, condition, capacity and dimensions of each class of car. Box cars thereafter to be built by the holding company conforming to one general design to be approved by the Master Car Builders' Association.

(d) *Current equalization of box car interchange balances between each road, member of the pool,* and each member with which it interchanges, the commissioner to have full author-

ity to assess appropriate penalties for failure to equalize balances within designated periods.

(e) Establishment of two per diem rates covering cars of steel or steel underframe construction and cars of wooden construction.

(f) Per diem charges to be determined upon which will defray recognized costs of car ownership, plus an amount that will cover all overhead and general expenses incident to car pool operations.

(g) In times of car surplus roads to be required to hold a number of cars equivalent to the daily average number of cars on their rails during previous period of maximum car demands.

(h) Restriction of delivery of empty box cars in interchange to cars which are in serviceable condition. Where member roads deliver bad order cars in interchange requiring transfer of lading, the delivering line to assume cost of transfer of lading and repairs to car.

(i) All repairs and maintenance chargeable to owners to be assumed by holding company. Repairs due to unfair usage to be charged as at present.

(j) Pool storage and repair yards to be located at convenient points.

NOTE: All special equipment to be handled strictly in accord with the car service rules.

ORGANIZATION

Election of committees and commissioner to be made yearly by roads, members of the plan, at the meeting of the American Railway Association, the vote to be on the basis of the number of cars contributed to the pool. The organization would comprise:

An *executive committee,* to be composed of members of the pool (seven) to decide upon applications for membership, determine upon the number, standard and class of cars to be assigned to the pool by each member, and to act as an advisory committee to the commissioner, adjust the car hire rate to be paid by member roads, increase the rates if conditions require, and determine upon the penalties to be paid by members for failure to equalize interchange balances upon demand of the pool commissioner. The committee also to have discretionary power to waive the enforcement of penalties when in its judgment such action is deemed expedient.

A committee of *auditors* (seven) to be appointed from roads members of the pool, to audit and approve the commissioner's methods of accounting for earnings of pool cars while in possession of member and non-member roads, and the distribution of earnings between member roads.

A committee representing the *mechanical department* (seven) to inspect and determine the general character, class, condition and appraised value of each car put into or withdrawn from the pool, and to definitely fix the standard to which the construction of box cars built in the future shall conform. Such committee should also audit and approve the commissioner's accounts of money paid for repairs to pool cars, and should approve all settlements made for pool cars destroyed, appraising and determining the current value of cars before they are withdrawn from the pool.

A committee of *car accountants* (seven) to audit and approve the commissioner's method of recording movement of pool cars and the method and form of reports used for arriving at the earnings of pool cars while in possession of member and non-member roads.

DUTY OF COMMISSIONER

Maintain record showing the location of cars, percentage of cars on tracks of member roads, and, so far as possible, insure to each member road the use of its proportion of equipment, as required; advise each member road daily of the per cent of pool cars on each railroad, and arrange for the equalization of equipment between members with minimum empty car haul, and minimum switching and other expenses.

GENERAL

Cost of operating pool to be prorated among the member roads in accordance with the average number of cars on the lines of each member road daily, each calendar month. Car maintenance expenses, actual cost of running repairs made to cars, to be figured at Master Car Builders' Association prices for labor and materials, and be prorated among the various roads subject to the car equalization plan, in accordance with the average number of cars on line of each member daily, each calendar month.

Box cars (unless bought by the pool outright) to retain their present ownership by the attachment of ownership plates to be inconspicuously placed on cars—the cars to bear proper pool marks, according to their classes.

The proposed equalization plan will not disturb the present local pool plans in effect on certain large railroad systems, nor will it interfere in any way with the car trust arrangements under which cars have been acquired by certain carriers.

ATTAINABLE OBJECTS

1. Standardization of box car equipment, with enormous economies in expense of car construction.
2. Decrease in the average expense for car repairs, due to standardization of parts.
3. Decrease in the average delay in making car repairs.
4. *Increased car efficiency.*
5. Higher average standard of maintenance of box car equipment, due to the control of this factor by the holding company.
6. Better handling of cars in yards and terminals, with the attendant decreased operating expenses.
7. Decreased expense for car accounting. The plan will permit of settlement for box car hire on interchange balances, instead of the present unsatisfactory and complicated method of accounting for per diem earnings, which is based on individual car numbers and reporting marks.

The object of this article is not to convey to the reader new ideas, but rather to refresh his memory on some of the details of a subject with which he already is familiar, a subject which he is not only familiar with, but warmly interested in. Therefore, the innumerable lessons of experience and the facts of present every day practice which support these seven points will not be enlarged upon in this place. That well-known facts do support them, amply, will be testified to by all railroad men whose study of the subject has been thorough and unprejudiced.

SIAMESE STATE RAILWAY RETURNS.—The annual report of the southern line of the Royal State Railways of Siam for the fiscal year ended March 31, 1916, shows that during that year 105 miles of new line were constructed, making a total length of 495 miles open to traffic at the end of the year. The gross revenue amounted to $564,779, showing an increase of $73,560, or 15 per cent, over that of the preceding year, caused partly by increased receipts on the southern sections. The gross working expenses totaled $340,173, being an increase of $40,406, or 13.5 per cent. The total number of passengers carried was 1,350,239, an increase of 29,136. The total amount of goods transported was 113,168 tons, an increase of 27,450 tons; while packages amounted to 15,476 tons, an increase of 1,740 tons. Live stock carried numbered 19,380 head, an increase of 5,272 head. Passengers yielded $400,193 of the revenue and goods $153.469. In the freight traffic of the line. as a whole. timber was the most important item, a position held by paddy the year before.—*Commerce Report.*

EDWARD E. LOOMIS

Edward Eugene Loomis, vice-president of the Delaware, Lackawanna & Western since 1902, was on February 21, as noted in last week's *Railway Age Gazette,* elected president of the Lehigh Valley, succeeding E. B. Thomas, who has been elected chairman of the board of directors.

Mr. Loomis entered the service of the Lackawanna in 1899 when W. H. Truesdale, who had just taken up the reins as president of the road, took him from the position of general superintendent of the New York, Susquehanna & Western and gave him the active management of the Lackawanna's vast anthracite coal interests. Three years later, or in 1902, he was elected senior vice-president in charge not only of the Lackawanna's coal interests—mining, transporting and selling—but also, under Mr. Truesdale, of all the activities of the railroad company.

Mr. Loomis occupied a position in the Lackawanna management that has few parallels in other railroad organizations. He was a member of the board of managers and in Mr. Truesdale's absence he acted as president of the railroad. On a number of occasions Mr. Truesdale spent some months in Europe and during these times, of course, Mr. Loomis actively managed the whole property. While much of Mr. Loomis' work was connected with the coal interests of the Lackawanna, the unusual part of his relations with the rest of the organization was due to the personal qualities and characteristics of the man. Mr. Loomis acted as adviser to many men in the organization who did not report directly to him, and it is an illuminating commentary on his characteristics that this relationship with officers who did not report directly to him was helpful, not harmful, to the smooth working of the organization. Mr. Loomis is eminently fair. He has a rather remarkable quality of patience, especially in arriving at his judgments. Able to grasp the large aspect of big problems, Mr. Loomis was also interested in details. He was interested in the design of new stations, and it may well be that the quite unusual architectural beauty of the Lackawanna's stations and of overhead and undergrade concrete structures is in part, at least, due to inspiration received from Mr. Loomis.

E. E. Loomis

Everybody on the road felt that he could go to Mr. Loomis with his problems; and they did go to him. His method of getting results is to lead rather than drive. It is probably no exaggeration to say that the majority of Mr. Loomis' subordinates never heard him speak a sharp, bitter word. A man would go to him with a grievance that seemed monumental, and within five minutes it would resume its normal proportions and could be discussed without heat. Approachable as Mr. Loomis was to everyone, he had the sincere respect of his subordinates to a marked extent. This was probably due in part to the recognition by everyone who dealt with him, of his unfailing fairness, and further to the fact that his popularity was not of the hand-shaking variety. He was a man of comparatively few words, and no pretense. Mr. Loomis is a man of quick decisions, but he has that quality of making his subordinates feel that they are both responsible and deserving of the credit for any undertaking which they are engaged in.

Edward Eugene Loomis is not yet 50 years of age. He entered railway work in June, 1883, as secretary to the attorney of the Denver & Rio Grande. In April, 1884, he entered the service of the New York, Lake Erie & Western, now part of the Erie, as secretary to the general superintendent. In 1887 he became chief clerk to the general superintendent, subsequently succeeding to the position of chief clerk to the general manager in October, 1892. November 19, 1894, he was appointed superintendent of the Tioga division and shortly afterward there was added to his duties the entire management of the Blossburg Coal Company, having large bituminous coal mining and lumber interests. From January 1, 1899, to June 15, 1899, he served as superintendent of the New York, Susquehanna & Western and the Wilkes-Barre & Eastern. He entered the service of the Delaware, Lackawanna & Western on June 15, 1899, as superintendent in charge of its coal mining interests and held that position until April, 1902, when he was elected vice-president.

Mr. Loomis' activities have not been confined to the railroad and coal mining business. He is a trustee of the American Surety Company, a director in three important New York banks, and as executor of the late Samuel L. Clemens, he is president and director of the Mark Twain Company. He is also an officer and director of various subsidiary and allied companies, which are part of or closely connected with the Lackawanna Railroad.

MILEAGE AND COST OF AUSTRALIAN LINES.—Making an early start with its railways, South Australia adopted the same gage (5 ft. 3 in.) as the neighboring State of Victoria for most of its main lines. Later on it adopted the 3-ft. 6-in. gage in the extension of its main lines northward and for all secondary lines. The State still continues, however, to build railways on the 5-ft. 3-in. gage, some 3¾ miles on that gage having been opened for traffic during the year ending June 30, 1916, bringing the total length of broad-gage lines up to 977 miles, which have cost (exclusive of equipment) £6,733,931 ($32,726,905) or £6,892.5 ($33,500) a mile on the average. Some 152 miles of broad-gage line have also been authorized, and their construction is in progress. The length of 3-ft. 6-in. gage line open is 1,209 miles, of which 22¾ miles were opened during the year under review, the cost of construction of the narrow-gage lines being £4,673,010, ($22,710,829) or £3,865 ($20,784) a mile on the average. For the system as a whole the cost of construction has been £11,406,941 ($55,437,733), averaging £5,217 ($25,355) a mile, exclusive of equipment, workshops, and certain station buildings and depots.

Kendrick Report on the Missouri, Kansas & Texas

Conclusions Arrived at After an Exhaustive and Minute Study of the Property and of Possibilities of Economies

J. W. KENDRICK, formerly vice-president of the Atchison, Topeka & Santa Fe, has completed his report for Speyer & Co., New York, on the Missouri, Kansas & Texas. The report goes into detail and fills 368 pages. The following is a summary of the report:

Summary of J. W. Kendrick's Report on Missouri, Kansas & Texas Lines

Declaration that the Missouri, Kansas & Texas Railway Company will require the expenditure of practically $65,000,000 during an eight-year period for necessary rehabilitation and improvements and the conclusion that ultimately $4,500,000 should be saved annually through increased efficiency and physical improvements, are the outstanding features of the report just made on the Missouri, Kansas & Texas Lines by J. W. Kendrick of Chicago. In Mr. Kendrick's opinion probably not more than $10,000,000 can be expended advantageously during the next two years. Certain of the economies in operation declared to be practicable cannot be realized for some time, in Mr. Kendrick's judgment, his estimate being that the net saving for the year 1920 should be $1,420,000.

Mr. Kendrick approves a budget prepared by C. E. Schaff, receiver of the property, covering the work of rehabilitation, improvement, and expansion necessary to place the lines in condition properly to perform their functions with the greatest operating economy, at an estimated expenditure of approximately $65,000,000, of which amount $10,000,000 is chargeable to operating expenses.

In the preface to the report, it is stated that at the time of making the report the road had already entered upon a period of intensive restoration and improvement. It continues: "Built originally as a granger line, with grades conforming as nearly as might be to the general surface of the territory traversed, with rails of light sections and odd weights, with narrow banks and cuts, many of the latter wet and undrained, with bridges much too light for modern requirements, and no engine terminals worthy of the name south of, and few north of, the Red river (the northern boundary of Texas); provided with light engines, most of them of antiquated design, and some of them of better design, but still light; guided by previous administrations which utterly failed to recognize the coming changes in transportation methods; handicapped by extraordinary interest charges upon an accumulated nondescript indebtedness, so large as to make it necessary to starve the property with respect to maintenance in order to keep it solvent, especially in view of the fact that the payment of dividends was commenced in 1906 and continued until 1914, during which time $4,160,000 was dispensed to stockholders that should have been returned to the property in the form of well conceived improvements, it was inevitable that a time would arrive when it would be necessary to make the expenditures required for the purpose of modernizing and strengthening the railroad to enable it to handle its traffic at least as economically as its competitors, and, if possible, with greater economy. The present administration took up the management of the property in 1912. For three years the struggle to pay interest was continued. During this term 105 heavy Mikados were purchased, a large number of cars that were unsuitable for service were scrapped, and improvements to the property, such as the replacement of weak bridges, and other undertakings that could not be longer deferred were entered upon, but the lack of funds made the vigorous prosecution of necessary undertakings impossible until after the receivership, which began on September 27, 1915.

"This report contains a narration of what has been accomplished, and the purposes of the receiver are given expression by the reproduction of his estimated cost of improvements that are considered indispensable. If the amount of this estimate seems large it should be remembered that it represents, for the most part, the cost of transforming about 1,600 miles (owned) of main line of an important railroad system from a state of comparative disrepair and inefficiency to a condition that will meet the requirements of modern transportation, and in connection with this to improve and strengthen physically the branches of the system to the extent warranted by their relative importance.

"Having recently traversed these lines, I hereby stamp these estimates with the seal of my approval as constituting a well considered plan for the prosecution of the various undertakings which are set forth in detail. I have spread these expenditures over a period of eight years because they cannot be performed advantageously in a shorter period; also because, in my judgment, as expressed in the following pages, certain changes in transportation and other methods can be adopted with great profit, and are more likely to be well considered if the work is conducted deliberately.

"The estimates for expenditures do not include any of the expenses of the receivership, or reorganization. In fact, they stand for, and include, only what is specifically stated.

"The reorganization should undoubtedly take into consideration the fact that the future requirements of the property for money will be considerable. They will by no means end with the expenditure of $65,000,000 as the railroad must be strengthened and provided with facilities to an extent sufficient to enable it to meet the requirements of the future without the necessity for another reorganization. That is, to my mind, the reorganization should be effected upon a basis which will make it possible to sell any amount of securities that may be required for the legitimate purposes of the property.

"The receiver's estimates contained in the report provide for every contingency that can be foreseen at present. The difficulty of providing for contingencies that may arise in the future (say within a period of eight years) must be recognized. Other extensions, or the acquisition of new lines not covered by the provisions of this estimate, may change the totals materially. So far as the property as it now stands is concerned—speaking of the work of improvement that must be undertaken and completed—the estimates should prove reliable, subject only to fluctuations in the prices of labor and material, which can neither be foreseen or controlled."

Discussing further the expenditures outlined in the receiver's budget, the report says:

"Consideration of these proposed expenditures during an inspection of the system served to establish the fact that for the most part they are necessary and must be made. Provision is made for the construction of certain new lines, one of which may not be undertaken, but, on the other hand, it will doubtless be necessary to expend large sums for purposes which cannot now be foreseen, so that, upon the whole, the estimate submitted is entitled to consideration as representing the future requirements of the company as far as the same can be anticipated."

With reference to the relation of capitalization and interest charges to the road's gross revenues, the report states that

"prior to the receivership as a natural consequence of excessive fixed charges, it was necessary to operate the road very closely to prevent default. It was originally constructed without reference to economical operation, with grades fitted to the natural configuration of the ground, with narrow banks and cuts, light bridges and rails and light power."

"The work of rehabilitation is being carried on in a thorough and systematic manner. The reorganization of the store department and the establishment of a proper relation between it and the purchasing department has been consummated, and, in fact, it may be stated in general that some of the changes recommended in this report, which will surely result in a large saving, have been made, or, in the natural order of things, will be made in future to the great benefit of the property."

The chief items of the budget for rehabilitation and improvement are as follows:

Standardization drainage and protection of roadbed	$1,265,000
Rail replacement	4,535,000
Ballast	4,085,000
Bridges	962,000
Replacing wooden trestles and culverts	1,481,000
Yard, industry, and passing tracks	2,060,000
Water stations	547,000
Fuel stations	195,000
Buildings, scales, crossings, assessments	1,786,000
Fencing and cattle guards	350,000
Shops, roundhouses, and machinery	2,745,000
Signals, telegraph, telephone, etc.	2,193,000
Track motor cars	70,000
Rock crushers	95,000
Grade revisions, new projects and extensions	14,075,000
Unanticipated	2,186,800
Equipment	26,133,750
Total	$64,764,750

On the basis of increase indicated by the showing in recent years, Mr. Kendrick estimates that the Missouri, Kansas & Texas gross earnings in 1920 will be about $39,000,000 or approximately $6,000,000 more than they were for the fiscal year ending June 30, 1916. Mr. Kendrick estimates that the net saving in expenses for 1920 on account of ultimate improved operation should be $1,420,000. The report presents the following table of estimated annual savings:

Loss and damage—Freight	$190,000
Freight handling	41,000
Handling package cars	25,000
Personal injury claims	337,000
Transportation	285,000
General office organization	100,000
Motive power	450,000
Freight equipment—Bills against foreign roads	242,000
Freight equipment—Maintenance	576,000
Passenger car repairs	95,000
Cross ties	650,000
Stationery	10,000
Purchases and stores	541,000
Fuel	500,000
Track motor cars	70,000
Grade revisions	432,000
Total ultimate estimated annual savings	$4,544,000

The report continues:

"Of these economies a certain portion cannot be realized for some time to come—for instance, the item of cross ties, $650,000. It is clear from the text on this subject that this saving cannot be secured until the main line is fully supplied with chemically treated ties of a class superior to those that are now being used."

With reference to the saving estimated to be practicable in connection with freight loss and damage, Mr. Kendrick recommends that the Missouri, Kansas & Texas reorganize and consolidate its freight claim department. He says, "It is true that the Missouri, Kansas & Texas has made considerable progress in the matter of decreasing claim payments in the last five years, but it is also true that the minimum figures have not been reached."

Mr. Kendrick points out that claim payments by the railroads of the country have increased to an alarming extent, the figures showing that the railroads with gross revenue in excess of $1,000,000 have increased their ratio of net loss per dollar of freight revenue from $1.29 in 1912 to $1.62 in 1914. The Missouri, Kansas & Texas per cent for 1912 was 3.01 per cent and for 1916 was 1.60 per cent, as against 1.75 per cent and .94 per cent on the Frisco for the corresponding years. Mr. Kendrick states that the trend of Missouri, Kansas & Texas claim payments is downward but that it is certainly possible to secure as good results upon the Missouri, Kansas & Texas as have been obtained upon the Santa Fe or Frisco.

The adoption of the drop truck system of handling freight in station warehouses in place of the gang system now in use is also recommended by Mr. Kendrick, which he estimates will result in considerable saving. The establishment of a merchandise bureau to supervise less than carload tonnage is also recommended as a step which should produce savings immediately.

Concerning the handling of expedited freight in package or merchandise cars, Mr. Kendrick says:

"Competition has been carried to such an extent in the Southwest that every device that could be thought of that will attract business to the various roads has been put into effect. The result is that the practices of all railroads confer upon consignees special and expedited service for which they do not pay. This would seem to be a subject which should be taken up by all of the competing lines whenever time schedules are considered and an agreement should be sought."

Mr. Kendrick recommends that the personal injury claim department of the Missouri, Kansas & Texas should be reorganized. He points out that the record pertaining to personal injuries shows weakness in this department, although there was a marked decrease, approximately $255,000, in the sums paid on account of personal injuries in transportation service in 1916 as compared with 1915, suggesting that "the campaign of rehabilitation and improvement of roadbed and equipment that is now being actively prosecuted must result in fewer train casualties and personal injuries and in improved morale of employees as well. After comparing the personal injury claim payment record with that of several other railroads, the report says:

"Of the roads with which comparison is made the Atchison, Topeka & Santa Fe makes the best showing. If the unit of personal injuries per 100 revenue train miles obtained by the Santa Fe system in 1915—namely $1.72—be applied to the train mileage of the M. K. & T. system in 1916 the personal injury claims for that year would have amounted to $241,629, a sum $337,000 less than the amount actually paid, a result that can and should be realized."

In considering transportation expenses, in which it is estimated an annual saving of $285,000 may be effected, Mr. Kendrick finds that because of greater mileage to many points, the Missouri, Kansas & Texas schedules, as a result of the efforts of the management to meet competition, are too fast for the most economical operation. He notes, however, that the Missouri, Kansas & Texas lengthened its freight train schedules to some extent in November and suggests that further reductions in these schedules seem desirable.

On the subject of increased train loading, the report says among other things:

"The management states that as soon as the side track extensions which are now under construction are completed it will be practicable to increase the length and tonnage of trains materially, and it will be noted that the trainload has been materially increased since 1913, when the first Mikados were purchased."

Concerning trainloading as compared to the Frisco, the Missouri, Kansas & Texas revenue trainload has increased from 268 for the fiscal year ending June 30, 1914, to 323 for the last fiscal year as against 297 and 334 on the Frisco for the corresponding years. The Missouri, Kansas & Texas trainload, including company material, has increased from 316 for the fiscal year ending June 30, 1914, to 391 for the last fiscal year as against 351 and 398 on the Frisco for the corresponding years.

Concerning passenger service, Mr. Kendrick says that in view of the fact that "passenger business is unremunerative at best, the dictates of good judgment should apparently limit this business to a minimum. Unfortunately trains that are now run cannot be discontinued without difficulty. It is fair to say that during the receivership this class of service has been curtailed and the good work should be carried farther."

It is Mr. Kendrick's opinion that a saving of $100,000 in salaries and expenses may be effected by consolidation of general office organization. The Missouri, Kansas & Texas traverses several states which have enforced compliance with their statutes making it obligatory for corporations organized or doing business within the state to maintain general offices therein. The management has estimated a possible saving of $225,000 if it were practicable to consolidate the lines of the system as a unit, but this cannot be realized. Mr. Kendrick suggests, however, that the spirit and letter of the law can be observed without maintaining "a separate and in a large measure independent organization in Kansas."

"Generally speaking," says Mr. Kendrick, "the grades of the Missouri, Kansas & Texas railway are unfavorable to economical operation by light power and this fact has been recognized by the present management." Regarding power, he says:

"It is evident that a great deal of this power is so old that it is impracticable to secure such efficiency of operation as to warrant its perpetuation. The reports of the company show a total of 395 freight engines available for service. The modern freight locomotives—that is, those of the Consolidation and Mikado types, are averaging 2,800 miles per month, which is fair."

Recommendations are made for changes in the method of handling the business of the locomotive shops and in the methods of mechanical accounting which will assist in effecting the economies estimated as practicable in transportation and maintenance expense.

The report says that "considering the design and construction of many of the freight cars which is inferior, the showing as to bad order is creditable, especially as a large number are equipped with devices which are obsolete and continually failing." It is suggested that like all railroads that have a large miscellaneous equipment purchased during a long term of years, the Missouri, Kansas & Texas has a great many cars that need reinforcement. The cost of maintaining freight equipment for the year ended June 30, 1916, is given as .0097 per car mile, while other railroads in the same territory are said to be maintaining freight equipment at a cost varying from six to seven mills per car mile. Draft rigging of faulty design is stated to be largely responsible for this excessive cost. It is recommended that in reinforcing freight equipment, long cast steel draft arms and friction draft gear be used instead of the full steel under frame reinforcement with transom spring gear which the management is now applying. If the cheaper device suggested by him is adopted for all the freight equipment which is in need of reinforcement, a large saving in the initial cost will result.

No recommendations are made for the reinforcement or betterment of passenger equipment as the work already under way or partially completed will meet all requirements.

Recommendations are made for the chemical treatment of all classes of cross ties, which it is estimated will result in a saving of $650,000 per annum in tie renewals. However, it is made plain that this latter saving cannot immediately be realized. Tie plates are also recommended as absolutely necessary to protect ties from mechanical wear in order to obtain the full value of treatment and unless ties are so protected the money spent for preservative treatment will be wasted. The number of tie plates required for the equipment of the principal lines it is estimated will cost practically $900,000.

The recommendations for the consolidation of the purchasing and stores departments are lengthy and elaborate. But in conclusion, the report says that on November 1, 1916 (before the report was made): "the care and supervision of material and supplies, new, second-hand, and scrap with the exception of fuel, were turned over to the purchasing and stores departments, which is in accordance with the recommendations contained herein."

The report recommends that some systematic consideration should be given to fuel economy with better records, performance, and fuel efficiency, and it is estimated that with the adoption of these recommendations and a campaign to secure increased interest in fuel economy, savings on account of reduced consumption, would reach 15 per cent.

The ballast program of the management is described as "well considered, the section conservative, and as the work is completed the track will be brought into first-class condition."

The report gives the miles of rail to be laid in the next four fiscal years as provided by the receiver's estimate as 22,300 tons in 1917; 23,080 tons in 1918; 27,670 tons in 1919, and 17,250 tons in 1920; and states that thereafter the normal requirements for rails will be 19,000 tons a year or about 130 miles of 90 pound section. The tonnage required in each of the four years specified in excess of 19,000 tons, and its value, represents arrearage in maintenance amounting to 24,300 tons at $30 per ton or $729,000. The estimate is prepared upon the basis of the prices in June, 1916, and is probably 25 per cent too small to meet present conditions. The arrearage charge to maintenance will therefore be about $911,000."

There is an acute need for roundhouse and turntable facilities.

With respect to the new freight and passenger terminals now under construction at San Antonio, Texas, Mr. Kendrick says that "there can be no doubt of the necessity for this general improvement, or of the fact that the business interests of the company will be served in a very important way by the development of this terminal. The property of the Terminal company is admirably located."

The report discusses in a v ry interesting way the relation of interest charges to gross and net revenues and makes comparisons with various other lines. He shows that on the basis of reported operations for 1915 the ratio of the interest or fixed charges to the income available for interest as follows:

	Per Cent
Missouri, Kansas & Topeka	81
Atchison, Topeka & Santa Fe	35
Chicago, Burlington & Quincy	27
Northern Pacific	43
Great Northern	24
Chicago & North Western	45
Union Pacific	33

In concluding his report, Mr. Kendrick has constructed an income account for the year 1920, making such adjustments from the results for 1915 as he considers probable and making due allowances for operating economies. This income account is as follows:

	Estimated 1920	
Operating Revenue	$39,400,000	
Operating Expenses	25,500,000	
Operating Ratio	64.7	
Net Operating Revenue	13,900,000	
Other Income	200,000	
Gross Income	$14,100,000	
Taxes	2,100,000	
Rentals, Leased Roads, Joint Tracks, etc.	700,000	
Other Deductions	50,000	
Total Deductions	$2,850,000	
Income from Operation	$11,250,000	
*Interest	$8,130,000	(72.26 per cent of amount available)
Surplus	$3,120,000	

*In calculating the amount of interest, he has added to the amount of $6,480,465 accrued in 1915 the sum of $1,650,000 as representing interest at 6 per cent on $27,500,000, one-half of the proposed expenditures for additions and betterments and equipment chargeable to property account.

In constructing the foregoing estimated income account,

Mr. Kendrick has arrived at the amount to be included in operating expenses as representing depreciation of equipment by assuming the value of equipment as of June 30, 1916, as $20,000,000 and adding thereto $1,250,000 as representing one-half of the charges for improving equipment and $11,750,000 as representing one-half of the proposed expenditures for new equipment, making a total value for equipment of $33,000,000 upon which he applies annual depreciation at the average rate of 4.1 per cent which he recommends.

SIDE BEARING LOCATION*

By Lewis K. Sillcox
Mechanical Engineer, Illinois Central

One of the refinements in the design of the average freight truck which seems to seldom receive definite attention and from the tendency of practice followed in certain sections of the country, it would appear as being entirely misunderstood, is the matter of the proper location of side bearings. The real truth of the matter has been forced on some roads through their experience with the derailment of locomotive tenders and it is made a live issue in this class of equipment principally because there is more liability for obtaining a higher center of gravity than is possible in the case of the usual freight car; the high center of gravity causing a great tendency for the equipment to roll dangerously. There is, generally speaking, only one remedy for such cases and that is to decrease the distance between the centers of the side bearings and this has been successful in eliminating the difficulty mentioned in most cases.

Derailments occurring in the case of freight equipment cars are so few considering the total number of cars handled that we are often led to believe that the location of the side bearings has nothing to do with the case. The raised outer rail of curved track is illustrative of track out of line, especially with respect to slow moving equipment. The same conditions may prevail at any point where the relative elevation of the

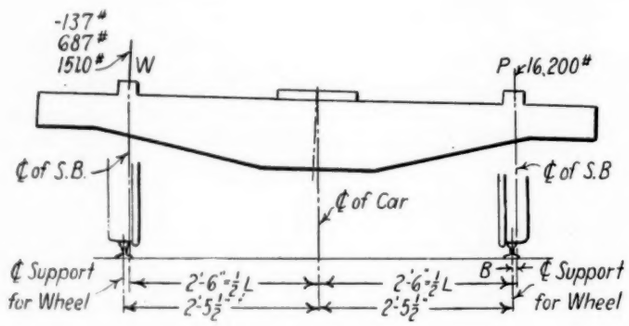


Fig. 1

rails is not uniform, because of soft spots in the track or improper ballasting.

The discussion of conditions, so far, brings up the study of the subject with respect to how far it is possible to transfer the loading to one side of the truck and still not reach the danger point, there not being enough load on the opposite side to hold the forward wheel to the rail when negotiating a curve, the forward wheel acting as a guiding element for the whole truck.

The load placed upon the guiding wheel to hold it down is in proportion to the total load carried by the wheel, which acts vertically to prevent the wheel climbing the rail. This resultant is influenced very materially by the distance from center to center of the side bearings. In order to appreciate this, we will consider the centers of the side bearings directly over the centers of the rails. In the case of a curve where the outer rail is elevated the inner side bearing is thrown over towards the outside of the rail. But this inner bearing is carrying the load and with its center approaching a point outside of the rail, it naturally follows that none of the weight of the car body is carried by the opposite wheels and therefore, no assistance is rendered these wheels in bringing them to bear on the rail. Fig 1 shows this condition.

Assuming W equal to the weight on the left side bearing, P (16,200 lb.) equal to the weight on the right side bearing, B, the distance between the center line of the right side bearing and the point of bearing of the wheel on the rail, and L

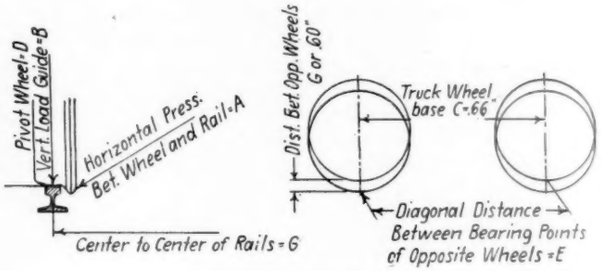

Pivot Wheel=D
Vert. Load Guide=B
Horizontal Press. Bet. Wheel and Rail=A
Center to Center of Rails=G
Dist. Bet. Opp. Wheels G or 60"
Truck Wheel base C=66
Diagonal Distance Between Bearing Points of Opposite Wheels=E

Fig. 2

equal to the distance between the center lines of the rails, we have, under the above conditions, the following:

$$\frac{W}{P} = \frac{B}{L} \text{ or } \frac{W}{16200} = \frac{0.5}{59} \text{ or } W = -135 \text{ lb.}$$

Now if the side bearings were spaced 54 in. center to center B would equal 29.5—27. = 2.5 and

$$\frac{W}{P} = \frac{B}{L} \text{ or } \frac{W}{16200} = \frac{2.5}{59} \text{ or } W = 687 \text{ lb.}$$

Still again with side bearing 48 in. apart B would be 29.5 —24 = 5.5 and

$$\frac{W}{P} = \frac{B}{L} \text{ or } \frac{W}{16200} = \frac{5.5}{59} \text{ or } W = 1510 \text{ lb.}$$

From the above, it is evident that in order to obtain any pressure on the guiding wheel in the case of cars engaging curves with elevated rails, or rough track where the surface of the rails is not uniform, it is first necessary to have the working position of the side bearing inside the line of support or rail.

In order to obtain a practical idea of the problem under discussion a 40-ton car was selected and weighed on a section of scale track having a 2-in. elevation, this height being considered as representing the full compression of the springs with the initial side bearing clearance added; thus throwing the load off the center and entirely on the side bearing. The results obtained were as follows:

With side bearings spaced 60 in. center to center the weight registered was 3,100 lb. With side bearings spaced 48 in. center to center the load registered on scales was approximately 5,000 lb.

The light weight of the car was 45,000 lb. with trucks registering 6,300 lb. each and the car body 32,400 lb. Being a car of rigid construction, it was possible for the diagonally opposite side bearings to carry the entire load, 16,200 lb. going to each. The difference in the amount of weight transfer, as between the car with 60 in. and 48 in. spread of side bearings, amounted to:

$$5{,}000 \text{ lb.} - 3{,}100 \text{ lb.} = 1{,}900 \text{ lb. or } \frac{1{,}900}{16{,}200} = 12 \text{ per cent.}$$

When the car is standing normally on level track, we should expect to carry the total light weight of the body on the truck center plates and there is a distance of approxi-

* Abstract of a paper presented before the Car Foremen's Association of Chicago.

mately 30 in. from the middle of the center plate to the center of the rail or support. At a distance 6 in. in along the bolster from the side bearing it was possible to transfer 12 per cent of the total load to the other wheel, or 2 per cent for every inch the side bearing was moved in toward the center. This rate of increase would probably be steadily maintained until the large bearing of the center plate equalized the loading, as in most cases it acts for a distance of about 5 in. all around the center.

Referring to Fig. 2 the following is assumed:

A = Horizontal pressure between the wheel and the rail.
B = Vertical load of the wheel on the rail.
C = Wheel base = 66 in.
D = Weight on pivot wheel.
E = Distance between the bearing points of diagonally opposite wheels on the rails = 89.4 in.
F = Adhesion between wheel and rail = 21 per cent of the load.
G = Center to center of rails = 4 ft. 8½ in. + ½ in. + 3 in. = 60 in.

As stated above there is no transfer of load from the inside bearing to the outside bearing when the bearings are 60 in. apart and that there is 2 per cent of the load transferred for every inch the side bearings are moved towards the center. With a car weighing (light) 45,000 lb., of which 12,600 lb. is the weight of the trucks and 32,400 lb. the weight of the body, we have for 54-in. side bearing spread

$$\frac{32{,}400}{2} \times .06 = 972 \text{ lb.}$$

of the weight of the car body going to the guiding wheels. For the 48-in. spread of side bearings we have

$$\frac{32{,}400}{2} \times .12 = 1{,}944 \text{ lb.}$$

of the weight of the car body going to the guiding wheels. This is based on results obtained from the actual tests mentioned above. Therefore, the weight on the pivot wheel *D* (Fig. 2) for the 60-in. spread of side bearings* is

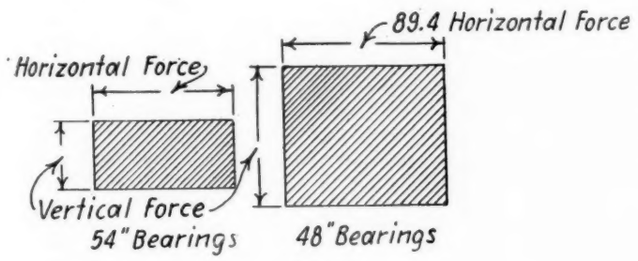


Fig. 3

$$\frac{45{,}000}{2} \div 2 = 11{,}250 \text{ lb.}$$

For the 54-in. spread of side bearing spread this weight will be

$$11{,}250 - 972 = 10{,}278 \text{ lb.}$$

and for the 48-in. side bearing spread this weight will be

$$11{,}250 - 1{,}944 = 9{,}306 \text{ lb.}$$

The horizontal force acting at the guiding wheel with the 54-in. spacing is equal to:

$$F\left(B + \frac{(D \times C) + (B \times G)}{E}\right) = 0.21$$

$$\left(972 + \frac{(10{,}278 \times 66) + (972 \times 60)}{89.4}\right) = 1{,}935 \text{ lb.}$$

The horizontal force acting at the guiding wheel with the 54-in. spacing is equal to:

$$0.21\left(1{,}944 + \frac{(9{,}306 \times 66) + (1{,}944 \times 60)}{89.4}\right) = 2{,}125 \text{ lb.}$$

*The light weight of the entire car was used in the above instead of considering the light weight of the car body and the trucks separately, to make the problem simpler.

The graphical chart (Fig. 3) shows how the forces were practically balanced with a spacing of 48 in. in centers.

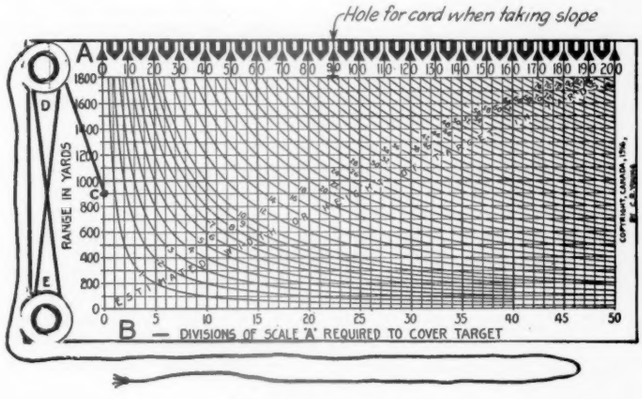
From the above comparison, it may be noted that by moving the side bearing only 3 in. in on each side of the car here considered (i. e. 54-in. to 48-in. centers) it is possible practically to equalize the vertical and horizontal forces.

The preceding figures have simply dealt with the light car body and trucks without load. As the vertical forces increase, it will be noted that a tendency prevails to accentuate the horizontal forces acting between the rail and the wheel flange, causing them to be more severe. As long as the capacity of the springs is not exceeded, they will prevent the side bearings from carrying the total load, a considerable proportion will be carried by the center plate and consequently distributed to the wheels on the far side of the truck. The great tendency, however, for most loaded cars, especially those having a high center of gravity, is to lurch towards the inner side of the curve, or the side where a low spot in the track occurs, and unless the forces acting at the side bearings are so applied as to prevent the guiding wheel from being relieved of sufficient loading to allow it to nose over the rail, great risk of derailment obtains.

Side bearing travel can be approximately calculated as follows: Multiply the distance in feet from center to center of trucks by the distance in inches from the center of the truck to the center of the side bearing, then divide this product by the radius in feet of the curve.

A HAND STADIA INSTRUMENT

A convenient and inexpensive range finder or stadia instrument has recently been placed on the market by R. C. Young, Toronto, Ont., which should prove of value in estimating distances in reconnaissance. It is based upon the ability of a man to estimate the height or width of objects seen at a distance, and consists of a card graduated along one edge like a stadia rod, upon which the observer reads off the length of the scale covered by a distant object with the card held before him in a plane at right angles to the line of sight. A cord of a definite length is attached to the card, the free end



The Range Finder

of which the observer holds to his eye so that the card is always at a fixed distance from the eye when in use. Having estimated the size of the distant object and the number of graduations of the scale covered by it, the observer refers to a diagram mounted on the card with these two quantities and notes the distance to the object in feet, yards or meters depending upon the unit used for the dimension of the object.

The back of the card is marked off as a protractor so that, with the use of the attached cord as a plumb line and the edge of the card as a line of sight, it is possible to read off the angle of the ground slope.

General News Department

The Supreme Court of Georgia has declared unconstitutional the act of the legislature of that state passed in 1915, designed to forbid the construction of a railroad parallel to the Western & Atlantic, owned by the state.

First aid to the injured, which is systematically taught at the shops and other important places on the Grand Trunk Railway, has during the past year been made a subject of instruction to women employees, considerable numbers of women having been employed in the place of men who have enlisted in the army.

Damage estimated from $25,000 to $30,000 was caused Illinois Central freight cars standing on the tracks in the vicinity of the Kentucky Public Elevator Company at Louisville, Ky., which structure was entirely destroyed by fire on the night of February 25. Many of the freight cars were loaded with merchandise and lumber. About 500,000 bushels of wheat, corn, rye and oats were also burnt up.

The twentieth annual meeting of the American Society for Testing Materials will be held at the Hotel Traymore, Atlantic City, June 26 to 30 next. Before selecting Atlantic City the executive committee canvassed the suggestions for places of meeting including Atlantic City, Chicago, New York, Washington and Pittsburgh, and found that over half of the suggestions favored Atlantic City.

The American Railway Engineering Association will make an excursion to Gary, Ind., and Buffington, Ill., on March 23, 1917, the day following the annual convention to be held in Chicago on March 20-22. Visits will be made to the Gary Steel Works of the Illinois Steel Company, the Gary plant of the American Bridge Company and the plant of the Universal Portland Cement Company at Buffington.

Bills limiting the length of freight trains have been introduced in the State legislatures of Missouri, Iowa, Kansas, Colorado, Utah, Nebraska, Texas, New York and Oregon. The bill introduced in the Missouri legislature limits the length of local trains to 30 cars and through freight trains to 45 cars. The provisions of the bills introduced in the other states differ as to details but are all alike in principle and purpose.

On the Pennsylvania Railroad System, including lines both East and West of Pittsburgh, the benefits paid in 1916 to employees and their families, through the relief department, amounted to $3,383,947. On the lines east of Pittsburgh and Erie, $760,346 was paid in benefits to the families of members who had died, and $1,464,453 to members for sick and accident benefits. Superannuation allowances paid to pensioned employees amounted to $165,813. On December 31 there were in the service of the Pennsylvania System 228,234 employees, of which number 193,931 were members of the Relief Funds.

The Illinois State Supreme Court on February 21 declared the Dunne deep waterway act constitutional. The law was passed in the last legislature and authorizes a $5,000,000 bond issue for the construction of an eight-foot canal between the Lockport end of the Chicago drainage canal, and the Illinois river at Utica. The decision of the Supreme Court overrules the opinion of the circuit court of the Sangamon district, which had held that a canal eight feet deep was not a waterway within the meaning of a constitutional amendment adopted by popular vote in 1908, allowing the legislature to bond the state up to $20,000,000 for building a waterway to connect Chicago with the Mississippi and the Gulf.

To call attention to what the Erie did to relieve the coal shortage at Chicago, F. D. Underwood, president of that railroad, recently sent a telegram to F. W. Upham, president of the Consumers' Company at Chicago, which reads as follows: "My understanding is that we in a measure saved the day so far as anthracite is concerned, and with bituminous coal we have but little to do. You might explain this to Mr. Griffin. The gentleman seems to lack information." According to the Chicago office of the Erie, that road delivered in Chicago a total of 300 cars loaded with anthracite from February 22 to 24, inclusive.

At the last meeting of the General Superintendents' Association of Chicago a resolution was passed recommending that in accordance with car service rule 1f now in effect, authority be granted the roads to deviate from car service rules 1, 2, 3 and 4, inclusive, in the loading of cars on switching lines within the Chicago switching district. It was also recommended that the various switching lines in the district make individual agreements with the roads, members of the association for the use of their cars in such service with such exceptions as may be necessary in each case to protect the loading of order cars and special equipment such as automobile, furniture, coal, coke, stock, refrigerator, ventilated, insulated and heated cars, provided that no car used in this service shall be reloaded by a switching line, receiving cars under load, except in accordance with the car service rules. A number of the roads, who had representatives at the meeting, have already followed the recommendation.

Crossing Disaster at Lima

At Lima, Ohio, February 28, 17 or more men were killed in a grade crossing accident. A factory bus carrying employees of the Ohio Steel Foundry was struck by a southbound freight of the Cincinnati, Hamilton & Dayton at Fourth street. The motorbus was demolished and its passengers hurled through the air, some falling beneath the engine wheels.

Disastrous Derailment in Sweden

A press despatch from Soderhamn, Sweden, February 27, reports the derailment of a train carrying 228 invalided Russian soldiers, who were on the way home from Germany through Sweden. The first car, carrying 23 insane Russian soldiers, was demolished, and all its passengers were killed. About 25 in other cars were killed. The work of rescue was made difficult by the condition of the passengers, most of whom were blind, had lost arms or legs, or were otherwise rendered incapable of helping themselves.

A Tank Car Fire

Ten thousand gallons of refined gasoline were threatened with destruction late yesterday afternoon when a tank car caught fire when standing on a siding of the Baltimore & Ohio at Eleventh and Pratt streets. Fifteen firemen fought the blaze for nearly half an hour. Railroad men feared an explosion and advised letting the gasoline burn itself out; but Captain Heikle believed the flames could be extinguished, and he ran a line of 350 feet of hose to a chemical engine. Water had no effect on the spurting flames, but after using 120 gallons of chemical solution, the blaze was extinguished. Not more than 50 gallons of gasoline were destroyed.—*Baltimore Sun.*

Arkansas Senate Honors Memory of F. H. Britton

The state senate of Arkansas, on January 24, passed the following resolution: Whereas on July 28, 1916, death removed from his sphere of activity and usefulness Frank Hamilton Britton, at the age of 65 years, and whereas Mr. Britton in his 17 years as president of the St. Louis-Southwestern, has contributed to the up-building of this commonwealth as no other agent in industrial expansion, and whereas his principles of humane treatment for employees and his development of the bonds of friendship between his transportation system and the people of Arkansas, has created a sympathy between the two that could be maintained with profit by the present management and emulated to advantage by other railroads of the state, therefore, be it resolved that the Senate of the State of Arkansas takes this means of expressing its sorrow and regret at his

demise, realizing that the people have lost a friend, that the commercial factories have been deprived of a wise guide and a staunch preceptor, and that this State can ill afford to spare those who have contributed so substantially to its advancement and prosperity.

Flood Control Bill Passed

The United States Senate on February 26 passed a bill which had been passed by the House of Representatives on May 17, 1916, authorizing the expenditure of $45,000,000 for continuing the work of levee building, bank revetment and other flood control work on the Mississippi river, under the control of the Mississippi River Commission, and of $5,600,000 for similar work on the Sacramento river in California, under the control of the California Debris Commission. The Mississippi river section of the bill provides that contracts may be entered into to the extent of $45,000,000 during the next five years in amounts not to exceed $10,000,000 per year, an amount equal to one-half of the amount expended by the national government to be paid by local governments. The Sacramento river section provides that the state of California is to appropriate a sum equal to that expended by the national government for the purpose of restoring navigation up to the city of Sacramento. Another section of the bill authorizes the War Department to examine flood control problems throughout the United States.

An amendment proposed by Senator Newlands providing for a waterways commission to make a comprehensive study of the waterway question with particular reference to its relation to transportation was rejected by a vote of 32 to 29.

Railroads Appeal to New Jersey

The presidents of the Pennsylvania, the Delaware, Lackawanna & Western and the Philadelphia & Reading, acting as an executive committee of railroads of New Jersey and Pennsylvania, have joined in a memorial to the people of New Jersey, asking them to repeal the "full crew law," so-called, of that state, and have printed their appeal in the newspapers. It says in part:

"Before the New Jersey Legislature is a bill to broaden the powers of the Board of Public Utility Commissioners. It is supported by the New Jersey State Chamber of Commerce, following exhaustive study of the problem, and by newspapers generally. It is heartily approved by the railroads. This will accomplish in reality what the 'full crew' law of 1913 was intended to do. The effect of that law so far has been to force upon the railroads in New Jersey a total cost of $1,250,000, which has accomplished nothing of value.

"Enactment of the bill will take nothing from the public that it does not restore in greater degree. For an arbitrary law the bill substitutes the intelligent judgment of selected men entrusted by the commonwealth with safeguarding and promoting the public interest.

"Under the existing statute railroads in New Jersey are compelled to carry on trains, where they are not needed, some 450 men who would be otherwise very advantageously employed. This bill will make certain that all railroads in New Jersey shall properly crew every train. The Utility Commissioners will make certain that trains are safely and efficiently operated, and prevent excessive duties being required of any man in train service. It protects the public interest, as the present law does not. It adequately safeguards rights of employees. It relieves the railroads from a useless operating charge now imposed upon them."

Texas Lines Pool Freight Cars

At a meeting of the transportation officers of the principal Texas lines held at Dallas, Tex., on February 19, an agreement was entered into under the provisions of Car Service Rule 1f, under which the lines involved will undertake to maintain a substantial balance of equipment as between themselves, with the understanding that no penalty will apply on cars subject to the agreement. If any road fails to equalize on the demand of other roads, the agreement may be cancelled as far as it is applicable to the offending road, on 10 days' notice. The effect of this agreement is to constitute a practical pool of cars among the lines which were represented at the Dallas meeting, although in its present form the agreement is lacking in a number of essentials of an ideal pool. It is thought, however, that a more definite arrangement may be entered into later, which will result in an actual regional pool. It is estimated that this arrangement will affect from 55 to 65 per cent of the foreign cars on the roads interested. These roads are parties to the recent agreement, which binds them to return cars to owners according to the A. R. A. rules, and, of course, must abide by the rules as regards cars belonging to all roads which are not parties to the Dallas agreement. The equalization scheme will no doubt result in a great saving in switching and empty haul, which is necessary when the ownership of cars is strictly respected under the car service rules. The roads which are at present parties to the agreement are the Southern Pacific Lines in Texas and Louisiana, the Missouri, Kansas & Texas, the Gulf Coast Lines, the St. Louis, San Francisco & Texas, the International & Great Northern, the Texas & Pacific, and the Galveston, Houston & Henderson. The plan has been submitted to other Texas roads with the suggestion that they also become parties to the agreement.

Freight Congestion Relieved

Supplementing the information given on a preceding page, the Car Service Commission has issued, at Washington, a statement to the effect that the congestion at Gulf ports had been materially reduced.

The total number of cars on hand for export and for coastwise lines was reduced from 7,300 on January 30 to 6,000 on February 13. The commission has sent a circular to all roads calling attention to the request of shippers of petroleum for relief from embargoes for fuel and light. Representatives of the Southern and the Seaboard Air Line appeared before the Commission on Wednesday and said they were in position to meet the requirements of the fertilizer shippers. The Seaboard Air Line had 1,000 box cars available and was asked to turn them over to the Mobile & Ohio, the Louisville & Nashville and the Nashville, Chattanooga & St. Louis.

Central Railway Club Annual Meeting

The annual dinner of the Central Railway Club will be held at the Hotel Statler, Buffalo, N. Y., on March 8. C. E. Denny, assistant to the president of the New York, Chicago & St. Louis, will be the toasmaster, and addresses will be delivered by Major-General George W. Goethals and by Eugene Chamberlin, manager of the equipment repair pool of the New York Central.

Special arrangements are being made to take care of a large New York delegation. If the number composing the delegation requires a special train over the New York Central it will be provided. Otherwise the delegation will have a private car for social recreation and refreshments, one twelve-section and drawing room and one sixteen-section Pullman sleeping car, and a ten-compartment Pullman car, attached to regular train No. 29 of the New York Central, leaving Grand Central Terminal, New York City, at 8:02 Wednesday evening, March 7, 1917, and due at Buffalo at 7:15 the following morning. Railroad and sleeping car fare is to be paid on the train, a party rate covering transportation. On the return trip, the party will leave Buffalo on the night of March 8, immediately after the dinner (probably about midnight) and ample accommodations will be provided for all on board.

Nineteen Passengers Killed at Mount Union, Pa.

The Pennsylvania Railroad was the scene this week of two disastrous wrecks, one east of Bristol, Pa., on the New York division, on Sunday about 2:45 a. m., when a fireman and three men riding in an express car, attending horses, were killed; and one at Mount Union, Pa., on the Middle Division, on the 27th, about 12:10 a. m., when 19 passengers and 1 sleeping car porter were killed.

At Bristol a westbound freight was derailed by a broken journal and the wreck fouled an eastbound track. On this track, the Adams express train, having no passenger cars, came on at high speed and ran into the derailed freight cars. The engine and six cars of this train fell down a bank, and the wreck took fire and was mostly burned up. The road was blocked for about 13 hours, during which time trains for the west were sent from Trenton over the Trenton Cutoff and those between Trenton and Philadelphia traveled over the line on the east side of the Delaware river, crossing the Delaware river bridge at Frankford.

At Mount Union, eastbound passenger No. 6 was standing at

the station, having been stopped about four minutes because of air brake trouble, when it was run into at the rear by a following fast freight, said to have been traveling at 40 or 50 miles an hour. The three rear cars of the standing train were sleeping cars, all of steel; and of the 20 or more passengers in the car "Bellwood," at the rear end of the train, nearly all were killed. The car body was split open, but the work of rescuing the injured persons was very slow and difficult. Among the killed was one family of nine persons; Chester A. Minds, wife, two children and five other relatives. Aside from the fatalities, the injuries to passengers were few and not serious. There was a dense fog at the time. According to the reports now at hand, the flagman of the passenger train went back several hundred feet and swung his red light, but he says that the engineman did not acknowledge it. The train appears to have passed a block signal about one mile back which was set against it; but the statements of the engineman, the fireman and a brakeman who was on the engine, have not yet been made clear and consistent.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City. Next annual convention, May 14, 1917, Hotel Chisca, Memphis, Tenn.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next convention, October, 1917, San Francisco, Cal.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago, Ill. Next meeting, June, 1917, Denver.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 8-10, 1917, Minneapolis, Minn.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—Fred C. J. Dell, 165 Broadway, New York.

AMERICAN RAILROAD MASTER TINNERS,' COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, St. Paul, Minn.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June 13-20, 1917, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago. Next convention, August 30-September 1, Hotel Sherman, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, May 22-25, 1917, Cincinnati, Ohio.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January, 1918, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Annual meeting, May 30, 1917, Hotel Jefferson, Richmond, Va.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J. Next meeting, May, 1917, Cincinnati, Ohio.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting, September 18-20, 1917, Washington, D. C.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lehon, The Lehon Company, Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except, June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual convention, June 19, 1917, Chicago, Ill.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next annual meeting, August 21-23, 1917, Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next meeting, May 14-17, 1917, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, September 4-7, 1917, Hotel Sherman, Chicago.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Annual convention, May 22-25, 1917, Hotel Jefferson, Richmond, Va.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 11, 1917, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June 13-20, 1917, Atlantic City, N. J.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Wm. H. Connolly, 1319 Columbia Road, Washington, D. C. Next annual convention, October 16, 1917, Washington, D. C.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March 19-22, 1917, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Annual meeting, May 9-11, 1917, Louisville, Ky.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1917, Atlantic City, N. J.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C., Collinwood, Ohio. Annual convention, May 21-23, 1917, Chicago.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. & W., Philadelphia, Pa.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next meeting, June 19, 1917, Fresno, Cal.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next convention, September, 1917, Chicago.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

The Traffic Club of the Board of Commerce of Flint, Mich., has voted to hold meetings twice a month, on the second and fourth Wednesdays.

The Traffic Club of Cleveland held its third annual banquet on February 14. Blewett Lee, general solicitor of the Illinois Central, was the principal speaker, his subject being "The Remedy for a General Railroad Strike." He said that a strike by the brotherhoods would cause more real hardship in this country than a war.

The Chicago, Burlington & Quincy on February 20 canceled its embargo on freight destined to points east of Chicago. The Delaware, Lackawanna & Western lifted its embargo on all westbound freight destined to points west of Buffalo on February 21. The Pittsburgh, Cincinnati, Chicago & St. Louis lifted its embargo against eastern freight westbound through Pittsburgh on February 21.

The Canadian Government, on February 23, issued new and stringent regulations for travel in Canada, especially for the prevention of the departure of any person who may be suspected of attempting to leave Canada for the purpose of communicating with the enemy. Inspectors are required to make rigid search of clothing and baggage and also of letters or messages, where such course is deemed necessary. The regulation concerning passports has been made more strict.

The commercial Club of Fargo, N. D., recently filed an informal complaint with the Interstate Commerce Commission calling its attention to a discrepancy in interstate and intrastate passenger fares between the Twin Cities and Fargo, N. D., and Moorehead, Minn. The rates between Fargo and Minneapolis are 92 cents more than the rates between Moorehead and the Twin Cities, the difference in distance between Fargo and Moorehead being less than one mile. The petition states that this condition is unjustly discriminatory against Fargo, N. D. and in favor of Moorehead, and suggests that inasmuch as the commission recently rendered a decision in the case of the St. Louis Business Men's League vs. The Santa Fe, the facts of which were similar, it can adjust the discrepancy in rates from Fargo and Moorehead to Minnesota points without requiring the filing of a formal complaint.

The number of ships which passed through the Panama Canal in 1916 was 1,253, or 83 more than the number making the transit in 1915. The net tonnage was less by 0.92 of one per cent in 1916 than in 1915, and the cargo was less by 0.69 of one per cent. The canal has not been open to all traffic throughout any of the calendar years in which it has been in operation. In 1914 there were only four and one-half months of traffic following the opening of the canal on August 15. In 1915 traffic was suspended from the middle of September to the close of the year, three and one-half months. In 1916 it was likewise suspended three and one-half months from the beginning of the year until April 15. Of 28½ months of time the canal was open 21½ months. Coastwise trade, reckoning on the basis of the net tonnage of the ships, formed only slightly over three per cent of the total traffic for the year 1916. In 1915, it was slightly over 27 per cent of all traffic, and in the four and one-half months of 1914 it was 44.4 per cent. These statistics show the strong demand that has developed for ships for foreign trade with the progress of the war.

Co-operation in Place of Competition

Beginning March 4, the Missouri, Kansas & Texas and the St. Louis-San Francisco will operate a passenger train jointly between St. Louis and Texas points, though each company has a line of its own. Southbound, the train will travel over the Frisco from St. Louis, Mo., to Vinita, Okla., 361 miles, and from there will go over the Katy. The train will leave St. Louis daily at 6:30 p. m., and will reach Dallas, Tex., 328 miles from Vinita and 689 miles from St. Louis, at 12:40 p. m. the next day; Fort Worth at 1 p. m. and San Antonio at 8:30 p. m. The train takes the place of the "Texas Special" of the M. K. & T. It will continue to have that name and the time of arrival at Dallas is the same as at present. To Dallas and other Texas points the new route of the train is 79 miles shorter than the old. Northbound the train leaves San Antonio at 9:30 a. m. and Dallas at 5:20 p. m.

Hearing on Baggage Charges in Iowa

A hearing was held before the Iowa Railroad Commissioners on February 27, to consider the application of the Travellers' Protective Association for a revision of baggage charges. The association asks (1) that 200 lb. of sample baggage be carried free of charge for each full passenger fare; (2) that the transportation charge on sample baggage in excess of 200 lb. per fare be one-eighth of the passenger fare expense for 100 lb.; (3) that the minimum charge for any shipment of excess weight of sample baggage shall be 25 cents; (4) that the storage of sample baggage either inbound or outbound, checked or unchecked, remaining at the station, shall be allowed on full passenger fares under the following conditions: First 24 hours, free of charge; second 24 hours, 25 cents for each piece; for each succeeding 24 hours 10 cents for each piece, provided that baggage shall be held free when received after 12 o'clock noon on Friday and claimed before 12 o'clock noon on Monday, or when received at any hour on Saturday and claimed before the same hour on Monday, or when received at any hour on Sunday and claimed before midnight Monday. If baggage is not claimed within the time above specified, storage charges shall commence 24 hours after the receipt of the baggage.

In allowing storage legal holidays shall be considered the same as Sundays, and when a legal holiday falls on Saturday or Monday, or is observed on either of these days, the Sunday and legal holiday combined shall be considered the same as one Sunday.

Chicago Board of Trade Clamors for Cars

J. B. Griffin, president of the Chicago Board of Trade, who sent a telegram to the presidents of eastern railroads two weeks ago, appealing for cars for the movement of grain in Chicago elevators, sent a second telegram to the eastern executives early last week, asking that the roads place an embargo on the movement of all freight, except food stuffs, coal and other commodities necessary to sustain human and animal existence. He stated that unless this were done there would be great danger of riot and anarchy throughout the land. At the same time he sent a message to the Interstate Commerce Commission asking that it issue an order in line with the request made on the eastern roads. In an interview with representatives of eastern papers, Mr. Griffin stated that, although the executives of eastern roads had promised to give food stuffs and coal precedence over other shipments in reply to his telegram, they had not done so, and that the situation had become even more acute. On February 21 Mr. Griffin sent a third telegram to the Interstate Commerce Commission, in which he strenuously protested against the sending of grain cars and flour cars to Minneapolis to be loaded east to relieve the alleged shortage there, when Chicago, a point 400 miles nearer the centers of consumption, had been given no definite assurance of any cars. In his own words, "eastern lines cannot or will not furnish us with cars, and by virtue of the agreement effective February 21, our supply of western and foreign equipment is cut off. We need 20,000 cars in Chicago to cover supplies now here, some of which should have been moved 90 days ago."

In a reply to Mr. Griffin on February 22, Commissioner Charles C. McChord, of the Interstate Commerce Commission, made the following statement:

"No statement made by me could possibly be construed as favoring any arrangement for Minneapolis which would create undue preference to that market or exclude Chicago from consideration. Further, your representatives here pointed out that Chicago grain interests have been getting 200 box cars per day by reloading western route cars made empty at Chicago with eastbound grain. They stated that they did not complain of the car shortage situation, as it existed, but were apprehensive that the new car service rules of the American Railway Association, effective February 21, would shut off Chicago's box car supply by making it impossible for the grain shippers to continue reloading western

route cars with eastbound grain. We were discussing with Crowley, vice-president New York Central Lines, the large accumulation of cars on their lines east of Buffalo and the comparatively large supply of cars which shippers in that territory had received. It was pointed out to him that at the Louisville hearing we had urged the New England carriers to have one or two fast days for shippers per week in order to enable those carriers to clear their rails of empty cars and start them west; that those carriers had found that practice was workable, and did not cause any substantial hardships to shippers. The same practice was suggested to Crowley, and it was pointed out that the car supply situation was not a local but a national question. He agreed that the fast day suggestion was practical, and promised to send empties west in trainloads. His efforts in that direction have been shown in telegrams repeated to you by wire yesterday, and are confirmed by our inspectors and additional wires today. The arrangement had no reference to limiting Chicago's car supply, but, on the contrary, should have the effect of substantially increasing it."

Western railway officials were of the opinion that if the Chicago grain and flour shippers were receiving fewer cars than Minneapolis, it was due to the fact that they did not make the proper representations to the Interstate Commerce Commission. The commission called a conference of western grain and milling interests and transportation officers at Washington on February 13, for the purpose of determining whether an emergency really existed warranting the movement of special trains of flour and grain to eastern points. Although the Chicago Board of Trade had been advised that the meeting was to take place, and was at liberty to send representatives to it, it had no one there. The Minneapolis interests, however, exhibited telegrams and letters from various eastern cities showing that the flour supply was dangerously sh rt at many points, and that New England was greatly in need of grain for feeding purposes. On the basis of this testimony it was arranged to send special trains of flour and grain east to the specific points where they were needed until relief had been effected. Mr. Griffin, on the other hand, showed no specific emergency in any parts of the east requiring the shipments of grain or flour from Chicago, but demanded that all other freight transportation be suspended, and nothing but grain, food stuffs, coal and other commodities necessary to sustain human and animal existence be shipped east. In view of the present congestion in the East, transportation officers stated that such a policy would bring relief to no one and would simply complicate an already acute situation. F. D. Underwood, president of the Erie, in a reply to one of Mr. Griffin's telegrams, gave a concise statement of the situation: "Your telegram served no purpose. The reason the Erie Railroad does not take grain out of Chicago is that it has no place to put it. It is not planned to block the lines with grain for which there is neither storage, shipping directions nor ships to carry it."

The New York Central lines, according to Mr. McChord's telegram, have agreed to send New York Central box cars west to relieve the situation in Chicago. It has been suggested by railroad officers at Chicago that the reason that Mr. Griffin showed no specific emergencies for the movement of grain or flour for the relief of eastern points, but asked for a blanket order providing for the movement of grain, flour, other food stuffs and coal to the exclusion of all other freight, was the desire on his part to move a large quantity of grain for export held in Chicago elevators. From 75 to 80 per cent of the grain stored at Chicago, it is stated on good authority, is for export. While the American Railway Association and the Interstate Commerce Commission are anxious to give all shippers as ample a car supply as possible, they do not feel it within their province to give special preference to the shipment of grain or flour unless it is shown to be necessary to relieve a serious food shortage.

In reply to the message of Charles C. McChord, of the Interstate Commerce Commission, showing him that the New York Central had agreed to send its own empties to Chicago to take care of grain shipments, Mr. Griffin sent a telegram to B. H. Meyer, chairman of the commission, on February 26, in which he stated that up to the time of sending the telegram he had been unable to find as many as 25 eastern line empties delivered by the New York Central for grain loading in Chicago. On February 24 he stated the New York Central lines had delivered two solid train loads of empties in Chicago, which consisted entirely of western line cars. He pointed out that the movements of western line empties to Chicago would not relieve the situation at Chicago because of the new car service rules effective February 21, prohibiting the use of those cars for return loading east.

Pennsylvania Embargo Committee

The Pennsylvania has established at Pittsburgh a "Pennsylvania System Joint Embargo Committee," to make all necessary and practicable modifications of embargoes. As a result of the committee's efforts there were moved in the week ending March 1, through the Pittsburgh and Buffalo gateways, more than 3,100 carloads of freight, which were under embargo and could not have been handled with equal promptness, if at all, except by special arrangement effected by the committee. Of this freight approximately 2,000 cars were eastbound and 1,100 cars westbound.

During the period in question the committee has had presented to it for consideration nearly 1,500 separate applications for individual shipments under special modifications of the embargoes. It granted about half of these applications. All shippers seeking special permits for the movement of embargoed freight have been placed upon an equal footing, and no requests have been declined, even temporarily, except by reason of actual necessity.

The committee virtually constitutes a clearing house for handling all requests for special movement, and shippers are relieved of the necessity of dealing with more than one representative of the road. The average length of time required to arrange a special modification of an embargo has been reduced more than half, and the number of modifications possible to allow has been greatly increased.

On the committee are: John M. Gross, J. E. Weller, John Callahan, Pennsylvania Lines West of Pittsburgh, Pa., and G. H. Burtis, two traffic men and two operating men. It is hoped within a few days to be able to remove the greater part of the restrictions on the movement of domestic freight, in either direction, throughout Pennsylvania territory. The general embargoes against export freight, requiring it to be accepted only where shippers have secured vessel space, are continued.

The Illinois Manufacturers' Association Protests Against New Car Service Rules

The traffic committee of the Illinois Manufacturers' Association on February 19 sent a telegram to the car service commission of the American Railway Association, protesting against the inauguration of the new code of car service rules requiring that empty cars be returned immediately to connecting lines. The telegram reads in part as follows: "If these rules are to be enforced literally, material coming into a great many plants would be unloaded from the cars and, the cars not being available for the outbound shipment, the carrier delivering would be required to move each empty to the junction point from which it was received and to haul an empty car from the junction point of the road via which the proposed shipment was to move. This would necessitate the handling of two empty cars for each load, whereas if the cars coming in under load should be loaded when empty with outbound material there would be no empty movement either in switching or line haul service. The shipping interests of the country demand that the facilities of the railroads be used to their maximum until the present congestion has been dissipated."

The commission on car service replied that while the new rules would entail some temporary hardship upon industries which had hitherto been amply taken care of in car supply it would improve the situation of those who had been deprived of the opportunity to ship their freight.

The Illinois Manufacturers' Association, in a telegram sent on February 24, took exception to this statement of the commission on car service, and asserted that the manufacturers of Illinois have not heretofore had an ample car supply, and were experiencing particular difficulty in securing open-top cars for loading. The telegram stated that freight house doors of eastern lines in Chicago are now closed to the shipping public because of the lack of box cars for loading. The new car service rules were declared to be responsible for this condition, and the situation will grow worse. The message closed by asserting that the rules would not only embarrass and injure the shippers, but would needlessly increase the expenses of the carriers.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended until June 29 an increased commodity rate on beer in carloads from LaCrosse, Wis., to Norfolk, Neb.

The commission has suspended until June 25 the cancellation of joint through rates on coal from mines on the Chicago, Burlington & Quincy in Illinois to Muscatine, Ia.

A hearing will be held in Chicago on March 1 before Examiner Disque of the Interstate Commerce Commission on the proposed revision of the Central Freight Association scale of class rates which has been suspended by the commission.

The commission has suspended until June 24 increased charges on shipments of livestock moving in interstate traffic between Kansas City, Mo., and various points in the state of Missouri in a tariff filed by the Chicago, Rock Island & Pacific.

The commission has suspended until June 25 the withdrawal of proportional commodity rates on cedar posts, poles and piling from East St. Louis, Ill., to Missouri River points applicable on shipments originating in Tennessee, Alabama, Georgia, Kentucky or Virginia.

The commission has suspended until June 20 a provision in a tariff filed by the Western Maryland that commodity rates on coal, carloads, from mines in western Maryland to St. Louis will apply only on traffic destined to that point. This would result in increasing the combination rates to Sedalia and other Missouri destinations.

The railroads having filed tariffs with the Interstate Commerce Commission to become effective on February 24, establishing rates in partial compliance with the commission's findings in the eastern export iron and steel rate case, the commission has entered orders vacating the suspension of tariffs heretofore filed in that case, with certain exceptions.

The Interstate Commerce Commission has announced that hearings will be held at Dallas, Texas, on March 12 before Examiner Thurtell in the Shreveport rate case, which the commission recently reopened at the request of Texas shippers and the Texas Railroad Commission. Representatives of the commission and of the shippers will be heard and the Louisiana commission in the Shreveport interests will also be represented.

The railroads throughout the country have filed tariffs with the Interstate Commerce Commission containing proposed changes in the rules, regulations and charges governing diversion and consignment of carload freight, including coal and coke, effective March 15 and at later dates. An informal conference on the applications of shippers to suspend these tariffs will be held on Thursday, March 8, before the commission's suspension board at Washington, D. C.

The Commission has suspended until June 29 schedules appearing in tariffs of various southeastern lines proposing increased commodity rates on lumber in carloads from points in southeastern and Mississippi valley territory to destinations in eastern trunk line and New England territories. Increases from points east of the Louisville & Nashville are from .2 to .8 of a cent per 100 lb., and from points of origin west of the Louisville & Nashville, generally speaking, and east of the Mississippi river the proposed increase is 1 cent per 100 lb.

The commission has postponed the effective date of its order of May 7, 1915, denying the application of the Lehigh Valley for authority to continue its interest in and operation of boat lines on the Great Lakes. The postponement was ordered on petition of the Lehigh Valley pending an appeal to the Supreme Court of the United States from a decision of the district court for the eastern district of Pennsylvania. The lower court on August 26, 1916, dismissed a petition to set aside the commission's order but continued in force an injunction previously granted against the enforcement of the order pending an appeal to the Supreme Court.

Western Export Iron and Steel Case

Opinion by Commissioner Daniels:

The carriers are allowed proposed increased commodity rates on iron and steel from Chicago, Pittsburgh and other points to Pacific coast terminals for export.

The rates relate almost entirely to the rates on structural material destined to the ports, among others, of Yokohama, Kobe, Nagasaki, Moji, Japan; Shanghai, Hongkong, China, and Manila. The present export rates to the Pacific coast ports are, from Chicago 30 cents, and from Pittsburgh 42 cents. These rates resulted from efforts to meet competition by rail and water from Pittsburgh via New York.

It is proposed to increase the rate from Chicago to 40 cents and from Pittsburgh to 45 cents, resulting in a spread of only 5 cents against Pittsburgh as compared with the present spread of 12 cents.

The rate from Pittsburgh to the Orient via New York is approximately 122.6 cents, made up of 11 cents to New York and 111.6 cents for the steamship service beyond. The ocean rate from the Pacific coast ports is about 90 cents, which, added to the proposed rate of 45 cents from Pittsburgh to the Pacific coast ports, would result in a total through charge of 135 cents. While this rate is about 12.4 cents higher than the rate from Pittsburgh via New York, the quicker service, reduced war risks and lower insurance rates which can be had if the traffic moves via the Pacific coast ports tend to equalize the rate disadvantage. Chicago, with the proposed rate of 40 cents, would get a through rate to the Orient via the Pacific coast ports of 130 cents, or 5 cents less than Pittsburgh would pay via the Pacific coast ports. The through rate from Chicago to the Orient via New York was shown to be 132.6 cents, made up of 21 cents to New York and 111.6 cents beyond.

Evidence shows that the proposed increased rate from Pittsburgh is as high as it can well be in view of the rates maintained by the lines from Pittsburgh via New York, and that the proposed rate from Chicago is as low as is required to meet competitive conditions. The carriers are therefore justified in establishing the changed spread proposed. The proposed rates are much less than the rates on domestic traffic and no question is raised respecting their reasonableness.

On traffic to Australia the proposed rate on most articles of iron and steel manufacture from Pittsburgh to the Pacific coast ports is 60 cents, as compared with 45 cents on traffic to the Orient. There are very few steamships plying between the Pacific coast ports and Australia and practically all the traffic to that continent moves via New York. The maintenance of different export rates to the same port dependent upon the foreign destination of the traffic, under such circumstances is not unlawful. (43 I. C. C., 131.)

COURT NEWS

Crossing Accident—Contributory Negligence

The Kansas Supreme Court holds that a person in an automobile who attempts to cross a track without looking for approaching trains, where there is a place 50 feet from the track from which an approaching train can be plainly seen, or who looks and sees the train coming and attempts to cross in front of it, is guilty of such contributory negligence as to prevent any recovery of damages for injuries sustained.—Pritchard v. A. T. & S. F. (Kan.), 162 Pac., 315.

Case of Connecting Carrier Handling Perishable Freight

The Minnesota Supreme Court holds that a common carrier of perishable freight is not an insurer of its delivery at destination in an undamaged condition. The rule in that state is that when the shipper has shown that the damage occurred while the goods were in the carrier's possession, a prima facie case of liability is made out, and the burden of proof is on the carrier to show that the damage was not caused by its negligence. Such a showing is a good defense, and it is not necessary to prove that the loss was caused by the natural tendency to decay. In the present case it was admitted that the damage was due to the freight, potatoes in sacks, being loaded in cars in which the wood of the floors was permeated with sal. These cars were furnished by a prior carrier. The unsuitable character of the

cars was not discoverable by the defendant on any reasonable inspection. The defendant was held not liable.—Higgins & Co. v. C. B. & Q. (Minn.), 161 N. W., 145.

Excessive Damages

Where a female passenger entered into an argument with the conductor relative to a difference of 10 cents in the fare, and the conductor before stopping the train took hold of her and turned her around in the aisle and talked gruffly to her without, however, using any insulting language or causing other than slight physical injury, the Springfield (Mo.) Court of Appeals held that a recovery of $750 was excessive above $500.—Briggs v. Lusk (Mo.), 190 S. W., 380.

Notice of Special Damages by Delay

In an action by a consignee against a railroad for damages caused by negligent delay in the transportation of crate material, the Florida Supreme Court holds that unless the railroad had, at or before receiving the crates for transportation, knowledge or notice of the particular special damages that would result from an unreasonable delay in the transportation, such special damages are not recoverable. If several elements of unusual or special damages would proximately result from the negligence, there must have been knowledge or notice as to each such element of damages as a probable result of the stated negligence before liability for such special damages arises in law. Where notice was given to the carrier of probable special damages as a result of unreasonable delay in transporting crate material after some shipments of such crate material had already been delivered to the carrier, such notice cannot be held to relate back, and the carrier would be liable only for special damages as for shipments received after such notice was given to it.—Florida East Coast v. Peters (Fla.), 73 So., 151.

Mechanics' Liens Against Railroads

The Wisconsin Supreme Court holds that where coal is furnished and in fact used in engines operating steam shovels, engaged in railroad construction work, since such coal does not actually go into the final product of the construction, a mechanic's lean against the railroad cannot be based thereon, under the statute giving a lien for materials used "for, in, or about" the structure. The court based its decision upon the principle that where material has been consumed in the construction of a building, it having had physical contact or immediate connection with the structure itself, there will be a lien therefor, but that if the material be used only to facilitate or make possible the operation of tools or machinery which, in their turn, act upon the structure, there can be no lien. The court cited in support of this proposition authorities from Massachusetts, Pennsylvania, Tennessee, Montana, Texas, Indiana, Michigan, New York and the federal courts. The provisions of the lien statutes in the states named are substantially similar in this respect to that of Wisconsin.—Carnegie Fuel Co. v. Interstate Transfer R. Co. (Wis.), 160 N. W., 1,046.

Care of Intoxicated Passenger

The Kentucky Court of Appeals holds that the fact that a passenger is drinking or under the influence of liquor is not enough to require the trainmen to give him any more care than other passengers, and it is only where a passenger is so much under the influence of liquor as to be helpless or irresponsible, or incapable of protecting himself from accident, and his condition is, or in the exercise of ordinary care could be, known to them, that they are under a duty to give him any extra care. In an action for the death of a passenger on the ground that he was so intoxicated as to be helpless and incapable of taking care of himself, and that his condition was known to, or in the exercise of ordinary care should have been known to the defendant's trainmen, and that they negligently permitted him to fall or jump from the car as it was approaching his station, evidence as to his condition as to sobriety three or four hours before he boarded the train for a ride of about 2½ hours was held too remote to be of any probative force. On the evidence, it was held that the defendant was entitled to a directed verdict, and judgment for the plaintiff was reversed.—L. & N. v. Mudd's Adm. (Ky.), 191 S. W., 102.

Railway Officers

Executive, Financial, Legal and Accounting

A. J. Hills has been appointed assistant to the executive of the Canadian Northern, with office at Toronto, Ont.

William W. Inglis has been appointed vice-president and manager of the coal mining department in full charge of the mining operations of the Delaware, Lackawanna & Western with office at Scranton, Pa.

Edwin M. Rine, general superintendent of the Delaware, Lackawanna & Western, at Scranton, Pa., has been appointed vice-president and general manager in charge of the operating department, with office at New York City. Mr. Rine was born on September 4, 1867, at Brilliant, Ohio, and was educated in the public schools. He began railway work in September, 1886, as a telegraph operator on the Pennsylvania Lines West of Pittsburgh. He later went to the Baltimore & Ohio, serving as train despatcher and then as trainmaster until October, 1899, when he went to the Delaware, Lackawanna & Western as train despatcher. About two months later he was made chief train despatcher, and later was made trainmaster. He subsequently served as superintendent of the Scranton division at Scranton, Pa., until March, 1908, when he was appointed superintendent of the Morris & Essex division of that road. On December 1, 1910, he was promoted to assistant general superintendent, which position he held until January 1, 1912, when he was appointed general superintendent and now becomes vice-president and general manager of the same road, as noted above.

Raymond Du Puy, president of the Virginian Railway, with headquarters at Norfolk, Va., whose resignation has already been announced in these columns, was born on January 4, 1860, at Pittsburgh, Pa., and was educated at the Georgetown University. He began railway work in 1877, as water boy on the Missouri, Kansas & Texas and from 1878 to 1881 was assistant engineer on the same road and the Missouri Pacific. He was then to 1885 chief engineer and superintendent of the Tioga Railway, now a part of the Erie, and later for two years was general superintendent of the Minnesota & North Western. From 1887 to February, 1888, he was general manager of the Chicago, St. Paul & Kansas City, now a part of the Chicago Great Western. In 1891 he was elected president of the Leavenworth & St. Joseph and from 1895 to 1896 was president of the DeKalb & Great Western; both these roads are now a part of the Chicago Great Western. On April 15, 1898, he was appointed general superintendent of the Chicago Great Western, remaining in that position until July, 1899, when he was appointed superintendent of the Morris & Essex division of the Delaware, Lackawanna & Western. He left the latter road in May, 1900, and then served for five years first as general manager and later also as vice-president of the St. Joseph & Grand Island, at St. Joseph, Mo. In April, 1905, he was appointed general manager of the Tidewater and the Deepwater Railways at Norfolk, Va., which were later consolidated to form the Virginian Railway. Two years later Mr. Du Puy was elected vice-president and general manager, and in February, 1915, became president of the same road, from which position he has resigned and intends to retire permanently from active

Raymond Du Puy

railway work. Mr. Du Puy's resignation is to take effect not later than May 15.

Operating

J. E. Duval, general superintendent of car service of the Grand Trunk System at Montreal, Que., has been appointed general superintendent of transportation.

F. M. Breen has been appointed superintendent of dining service of the Delaware & Hudson, with office at Albany, N. Y., vice D. B. Horn, assistant manager of dining service, resigned.

Elliott G. Atkins, superintendent of the Chicago, Milwaukee & St. Paul at La Crosse, Wis., has been appointed superintendent of the Chicago & Milwaukee division, with headquarters at Chicago, Ill.

H. J. Humphrey, superintendent of the Canadian Pacific at Farnham, Que., has been appointed acting superintendent, Laurentian division, with office at Montreal, in place of R. McKillop, enlisted for overseas service.

R. F. Carr, superintendent of the Southern division of the St. Louis-San Francisco, with office at Memphis, Tenn., has been appointed assistant general manager, with headquarters at Springfield, Mo. P. O. Wood, now assistant general superintendent of motive power with office at Springfield, Mo., has been appointed division superintendent with headquarters at Memphis, succeeding R. F. Carr.

J. E. Murphy, trainmaster of the El Paso & Southwestern System, with office at Douglas, Ariz., is now in charge of the line from Douglas to Tucson, Ariz., including the Courtland branch, Douglas yard, and all branch lines west, and R. P. Kyle has been appointed trainmaster, with jurisdiction between El Paso, Tex., and Douglas, Ariz., including the Deming branch and Burro Mountain Railroad, with headquarters at Douglas.

C. J. Phillips, superintendent of the Morris & Essex division of the Delaware, Lackawanna & Western, at Hoboken, N. J., has been appointed general superintendent with headquarters at Scranton, Pa., succeeding E. M. Rine, promoted. H. H. Shepard, superintendent of the Buffalo division at Buffalo, N. Y., succeeds Mr. Phillips, and F. M. Benning, assistant superintendent at Hoboken, N. J., has been appointed superintendent of the Buffalo division, succeeding Mr. Shepard.

W. R. Smith, assistant general superintendent of the Great Northern, at Great Falls, Mont., has been appointed assistant general superintendent of the Western district, with headquarters at Spokane, Wash., vice G. S. Stewart, who has been appointed general superintendent of the Lake district at Superior, Wis., succeeding F. S. Elliott, and Mr. Elliott has been appointed general superintendent of the Central district, at Great Falls, Mont., succeeding F. D. Kelsey, assigned to other duties as assistant general superintendent of the Central district, with headquarters at Great Falls. Effective March 1.

M. B. Casey, whose appointment as superintendent of transportation of the Wabash, with office at St. Louis, Mo., was announced in these columns several weeks ago, began his railway career with the Louisville & Nashville on April 1, 1881. After holding minor positions with this company he was appointed superintendent of the Union Freight Transfer, Louisville, Ky., and later returned to the Louisville & Nashville as depot master at Louisville. Some time later he was made chief clerk in the general offices of the Illinois Central, at Chicago, Ill., and was then appointed superintendent of car service for the Delaware, Lackawanna & Western, with office at Scranton, Pa., which position he held at the time his appointment as superintendent of transportation became effective.

Albert S. Ingalls, whose appointment as general manager of the New York Central Lines West of Buffalo was announced in these columns last week, was born at Cincinnati, Ohio, February 2, 1874. After graduating from Harvard University he entered railway service in 1896 as a clerk in the office of the general manager of the Cleveland, Cincinnati, Chicago & St. Louis, since which time and up to June, 1911, he consecutively passed through the positions of assistant superintendent of the Cleveland-Indianapolis division, superintendent of this same division, assistant general superintendent of the Lake Shore & Michigan Southern, the Dunkirk, Allegheny Valley & Pittsburgh and the Lake Erie, Alliance & Wheeling jointly. In June, 1911, he was appointed general superintendent of these same roads and in January, 1915, became general superintendent of the New York Central Lines West of Buffalo, with office at Cleveland, which latter position he held at the time his present appointment, as noted above, became effective.

Traffic

Stuart A. Allen, general eastern freight agent of the Baltimore & Ohio, at New York, has been appointed general freight agent with headquarters at New York; and Golder Shumate, division freight agent, at Baltimore, Md., has been appointed assistant general freight agent with headquarters at Baltimore.

John Francis Gaffney, Jr., whose appointment as assistant general passenger agent of the Nashville, Chattanooga & St. Louis, with office at Nashville, Tenn., has been announced in these columns, was born at Nashville, Tenn., on November 25, 1882. He entered railway service as a file clerk in the office of the general passenger agent of the Nashville, Chattanooga & St. Louis on August 1, 1902. Later he was stenographer to the chief rate clerk. He also served in a similar capacity to the assistant general passenger agent. In June, 1911, he was transferred to the city passenger office at Nashville, and in July, 1912, was made city passenger agent, the position he held at the time his recent promotion, as noted above, became effective.

J. F. Gaffney, Jr.

R. D. Jennings, traveling freight agent of the Southern Pacific, with headquarters at Portland, Ore., has been appointed commercial agent, with headquarters at Spokane, Wash., a newly-created office.

Eugene B. Finegan, who was appointed assistant general freight agent of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, Ill., as has already been announced in these columns, was born at Iron Ridge, Wis., on November 16, 1883. Upon graduating from Hess College at St. Paul, Minn., he studied for a year at the University of Minnesota. On June 1, 1904, he entered railway service with the Chicago, Milwaukee & St. Paul as a stenographer in the office of the commercial agent at St. Paul, and was appointed chief clerk to the assistant general freight agent at Chicago, Ill., on November 15, 1906. On June 1, 1910, he was promoted to chief clerk to the general freight agent and later became chief clerk for the freight traffic manager. On August 1, 1914, he was appointed chief clerk to the vice-president and on April 1, 1916, he was advanced to chief of the tariff bureau. His present appointment, as noted above, became effective February 1, 1917, when he succeeded C. A. Butler, promoted.

E. B. Finegan

J. H. Burtner, division freight and passenger agent of the Los Angeles & Salt Lake at Riverside, Cal., has been appointed general agent with the same headquarters. Other appointments

in the traffic department of this company are as follows: Russell Ball, general agent at Pasadena, Cal.; C. C. Jewitt, general agent at San Diego, Cal., and B. M. Jones, district freight agent at Los Angeles, Cal.

W. V. Kennedy, managing clerk in the office of the traffic department of the Erie Railroad at New York, has been appointed division freight agent with headquarters at Rochester, N. Y., succeeding C. C. McCord, resigned to go into other business. Effective March 1.

Wins Faulkner Wilson, who has been appointed assistant general freight agent of the Southern Railway, with headquarters at Richmond, Va., as has been announced in these columns, was born on March 9, 1876, at New Orleans, La. He graduated from the Richmond High School in 1893; then for two years attended Richmond College and began railway work on May 5, 1897, as a stenographer in the general freight office at Richmond of the Southern Railway. He subsequently served consecutively as tariff clerk, chief clerk, soliciting agent and then as commercial agent at Richmond, Va., and now becomes assistant general freight agent of the same road as above noted.

Guy Tombs, general freight agent of the Canadian Northern at Montreal, Que., has been appointed assistant freight traffic manager, with headquarters at Montreal. He was born on November 22, 1877, near Lachute, Que., and was educated in the public and high schools of Montreal. He began railway work in September, 1892, as junior import clerk with the foreign freight agent of the Canadian Pacific at Montreal. From April, 1895, to August, 1897, he served as secretary to the general manager, also as secretary to the United Counties Railway at St. Hyacinthe, Que. He subsequently was appointed chief clerk to the Canadian agent of the Central Vermont, at Montreal, and later was rate clerk to the division freight agent of the Grand Trunk at Montreal, and traveling freight agent of the Central Vermont at St. Johns, Que., and at St. Albans, Vt. In May, 1901, he was appointed general freight and passenger agent of the Great Northern of Canada and later served with its successor the Canadian Northern Quebec, including the Quebec & Lake St. John. In June, 1912, he became general freight agent of the Canadian Northern, Quebec division, at Montreal, and in November, 1916, he was appointed general freight agent of the Canadian Northern, Eastern lines, from which position he is now promoted to assistant freight traffic manager of the same road as above noted. From April, 1910, to April, 1916, he was also the Montreal representative of the Canadian Northern Steamships, Limited.

Guy Tombs

Engineering and Rolling Stock

George L. Ermstrom has been appointed road foreman of engines on the Yellowstone division of the Northern Pacific, with headquarters at Glendive, Mont.

H. Honaker, master mechanic of the St. Louis-San Francisco at Memphis, Tenn., has been appointed assistant general superintendent of motive power with headquarters at Springfield, Mo.

Irving Williams has been appointed assistant master mechanic of the Cumberland Valley Railroad with office at Chambersburg, Pa., vice R. G. Bennett, resigned, to become assistant engineer of motive power of the Pennsylvania Railroad with office at Williamsport.

F. W. Douglas, chief engineer electrical department of the Atlanta Joint Terminals of the Louisville & Nashville, Atlanta & West Point, and Georgia Railroad, at Atlanta, Ga., has been appointed master mechanic, in addition to his other duties, vice G. W. Eaves, resigned.

Amos Wilson, special instructor in the motive power and equipment department of the Delaware, Lackawanna & Western at Scranton, Pa., has been appointed supervisor of fuel service, with headquarters at Scranton, succeeding M. C. M. Hatch, resigned. J. R. Steed has been appointed assistant supervisor of fuel service, with headquarters at Scranton.

M. J. Connerton, roadmaster of the Cincinnati, New Orleans & Texas Pacific at Danville, Ky., has been appointed engineer maintenance of way, southwest district, Southern Railway System, lines west, with headquarters at Chattanooga, Tenn. His jurisdiction includes the lines from Cincinnati, Ohio, to New Orleans, La., inclusive, the main line of which comprises the Cincinnati, New Orleans & Texas Pacific, the Alabama Great Southern and the New Orleans & Northeastern.

W. C. Kegler, engineer maintenance of way of the St. Louis division of the Cleveland, Cincinnati, Chicago & St. Louis at Mattoon, Ill., has been appointed engineer maintenance of way of the Cleveland-Indianapolis division, with headquarters at Galion, Ohio, vice C. W. Cochran, resigned. A. F. Maischaider, engineer maintenance of way of the Cairo division at Mt. Carmel, Ill., succeeds Mr. Kegler. J. E. Kissell, engineer maintenance of way, at Indianapolis, Ind., succeeds Mr. Maischaider, and L. B. Elliott succeeds Mr. Kissell.

OBITUARY

Joseph L. Willcut, who retired as secretary of the Southern Pacific in 1908, died on February 27 at Oakland, Cal., at the age of 88.

William R. Cahill, formerly division superintendent of the Union Pacific, with headquarters at Omaha, Neb., died on February 24 at Los Angeles, Cal., of indigestion, at the age of 51.

Frederick C. Daab, treasurer of the Terminal Railroad Association of St. Louis, Mo., died at Miami, Fla., February 23. He was born in Belleville, Ill., 61 years ago. He was for a time cashier in the East St. Louis freight office of the Cairo Short Line, now a part of the Illinois Central. He went from the Short Line to the Terminal Railroad Association of St. Louis 37 years ago, starting in as a cashier when 24 years old. He was advanced to paymaster after a few years and had been treasurer for about 15 years.

F. C. Daab

Charles W. Marquardt, general freight and passenger agent of the Copper Range with office at Houghton, Mich., died at his home in that city on February 22. He was 35 years old.

J. B. Modisette, general passenger agent of the Pennsylvania Lines West of Pittsburgh, St. Louis System, with headquarters at St. Louis, Mo., died at Pasadena, Cal., on February 21, aged 58 years. He was born at Uniontown, Pa., and attended Cheltenham Academy at Philadelphia, Pa., and later studied at Pottstown. He entered railway service in 1880 as an assistant ticket agent at Cincinnati, Ohio. Later he was consecutively chief clerk in the office of the assistant general passenger agent at Chicago, Ill., chief clerk in the passenger department of the Vandalia at St. Louis, city passenger agent at Chicago, district passenger agent and assistant general passenger agent at Cleveland, Ohio. In 1907 he was first assistant general passenger agent of this company, with headquarters at St. Louis, and in February, 1910, he was promoted to general passenger agent with the same headquarters, this latter being the position he held at the time of his death, as noted above.

Equipment and Supplies

LOCOMOTIVES

THE CHICAGO, BURLINGTON & QUINCY is reported in the market for locomotives.

THE CANADIAN COPPER COMPANY has bought a Prairie locomotive from the Pere Marquette.

THE CHICAGO, ROCK ISLAND & PACIFIC is in the market for 20 Mikado and 10 Santa Fe locomotives.

THE LOUISVILLE & NASHVILLE is buying specialties for 6 Mikado locomotives to be built in its own shops.

THE ALGOMA EASTERN has purchased from the Chicago Great Western one ten-wheel and 4 Consolidation locomotives.

THE CARNEGIE STEEL COMPANY has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works for its Homestead plant.

THE ALUMINUM COMPANY OF AMERICA has ordered one eight-wheel switching locomotive from the American Locomotive Company. This locomotive will have 22 by 28 in. cylinders and a total weight in working order of 203,000 lb.

THE PITTSBURGH & WEST VIRGINIA (formerly the Wabash Pittsburgh Terminal) has ordered 3 Consolidation locomotives from the American Locomotive Company. These engines will have 25 by 32 in. cylinders and a total weight in working order of 233,000 lb.

FREIGHT CARS

THE FLORIDA EAST COAST is in the market for 200 steel flat cars.

THE GREAT NORTHERN is inquiring for 300 all-steel gondola cars.

THE MILWAUKEE ELECTRIC RAILWAY is inquiring for 200 general service cars.

THE CONSOLIDATION COAL COMPANY has ordered 300 hopper cars from the Pullman Company.

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, is in the market for 40 to 50 second-hand tank cars.

THE ALASKA ENGINEERING COMMISSION has ordered 20 freight cars from the Seattle Car & Foundry Company.

TETER & JOHNSON, 20 E. Jackson boulevard, Chicago, are inquiring for 25 8,000 to 10,000 gal. capacity tank cars.

THE SUN SHIP BUILDING COMPANY is reported as having ordered 100 tank cars from the Cambria Steel Company.

THE PERE MARQUETTE.—The Haskell & Barker Car Company has submitted the lowest bid on the inquiry for 1,000 cars.

THE CHICAGO, MILWAUKEE & ST. PAUL is inquiring for 50 special refrigerator cars for shipments of silk and fish.

THE FRENCH GOVERNMENT has now placed orders with the Standard Steel Car Company for from 12,000 to 14,000 cars, of which 2,300 will be large two-truck cars and the remainder smaller four-wheel cars. The Standard Steel Car Company is called upon to erect these cars in France and already has an erecting shop in operation in that country.

PASSENGER CARS

THE GREAT NORTHERN has issued inquiries for 20 all-steel postal cars.

THE CHICAGO, MILWAUKEE & ST. PAUL is in the market for 10 50-ft. baggage cars.

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, is in the market for one second-hand 40 to 50 ft. baggage and express car.

IRON AND STEEL

THE BELGIUM STATE RAILWAYS have issued an inquiry for about 25,000 tons of 85-lb. rails.

THE FRENCH GOVERNMENT has ordered 50,000 tons of steel rails for 1918 delivery, from the United States Steel Corporation.

THE ST. LOUIS-SAN FRANCISCO has ordered 1,004 tons of steel from the McClintic-Marshall Company for various deck plate girder bridges.

THE NEW YORK, NEW HAVEN & HARTFORD is reported as having ordered 7,000 tons of bridge steel from the American Bridge Company.

THE PENNSYLVANIA LINES WEST have ordered 1,500 tons of steel from the Fort Pitt Bridge Works, 1,300 tons from the McClintic-Marshall Company, and 1,000 tons from the American Bridge Company for grade elimination work in Chicago.

SIGNALING

The BOSTON & MAINE has ordered from the Union Switch & Signal Company material for a 56-lever electro mechanical interlocking at North Cambridge, Mass.

The ST. LOUIS-SAN FRANCISCO has ordered from the Union Switch & Signal Company material for a mechanical interlocking plant, 36 levers, at the crossing with the Missouri, Kansas & Texas at Muskogee, Okla.

The CINCINNATI, NEW ORLEANS & TEXAS PACIFIC has ordered from the Union Switch & Signal Company 19 style F automatic block signals and 6 bracket signals to be installed near Lexington, Ky. The apparatus will be installed by the railroad company's forces.

The PENNSYLVANIA LINES WEST will instal a mechanical interlocking at the crossing with the Cleveland, Cincinnati, Chicago & St. Louis at Worthington, Ohio; a 48-lever Saxby & Farmer frame with 37 levers and 11 spare spaces. Installation will be done by the railroad forces. The material is furnished by the Union Switch & Signal Company.

Extensive New Signal Work in New York City

The Interborough Rapid Transit Company has awarded to the Union Switch & Signal Company a series of contracts to provide the interlocking and automatic block signals for a half dozen of the new subway and elevated lines now under construction in the boroughs of Manhattan and Bronx, New York City, the lines of road aggregating 30 miles or more in length. The Lexington avenue line, northward from the Grand Central Terminal at 42nd street, for about five miles, is underground; but substantially all of the rest of the lines covered by these contracts are on elevated structures. On the White Plains road, about five miles, three track, the contract provides for three interlockings and no block signals; but most or all of the rest of the mileage includes both interlockings and block signals. All of the interlocking is electro-pneumatic, and all of the automatic signals are light signals, giving their indications by the colors—green, yellow or red, both night and day. The interlocking signals are light signals, where located in the subway, and semaphores where they are on elevated structures. On the Queensboro bridge line there is one interlocking plant, 19 levers, and the automatic block signals number 25. On the Lexington avenue line there are 14 interlocking plants and 132 automatic signals; Corona line, 7 interlockings, 17 automatics. On the new third tracks of the elevated lines in Second, Third and Ninth avenues, built last year for the use of express trains, there are 22 interlockings and 406 automatic signals. Electro-pneumatic train stops are provided throughout.

The fourteen interlockings on the Lexington avenue line aggregate 204 levers; the seven on the Corona line aggregate 93 levers, and the 22 machines on the Second, Third and Ninth avenue express tracks aggregate 590 levers.

The work of installing all these signals will be done by the railroad company's forces. The Interboro is also about to instal automatic and block signals on the new subway line in Seventh avenue, Manhattan, about 16 miles of track. The arrangement is in general the same as that of the Lexington avenue line, mentioned above.

Supply Trade News

Warren Corning & Co. have been appointed railway selling agents of the Pittsburgh Shovel Company, with headquarters at Chicago.

The Titanium Alloy Manufacturing Company has moved its New York office from 15 Wall street to the City Investing building, 165 Broadway.

F. L. Gordon has been elected assistant to the vice-president of the American Brake Shoe & Foundry Company, with headquarters at Chicago.

George Smart, for the past twelve years editor of the Iron Trade Review, has resigned to accept a position as associate editor of the Iron Age.

James McNaughton, who recently resigned from the vice-presidency of the American Locomotive Company, has been appointed assistant to the president of the Eddystone Ammunition Corporation.

Grayson M. P. Murphy, vice-president of the Guaranty Trust Company, has been elected a director of the Bethlehem Steel Corporation, succeeding William M. Barnum, resigned. W. F. Hartmann, assistant treasurer of the Bethlehem Steel Company, has been elected a vice-president of the Bethlehem Steel Corporation.

Harlow A. Varney, formerly in charge of sales in the railway department of the National Boiler Washing Company and more recently connected with the Smith-Totman Company in a similar capacity, has been appointed general sales manager of the Paige & Jones Chemical Company, of New York, with headquarters at Chicago.

Alexander P. Robinson, formerly vice-president and treasurer of the Cambria Steel Company, died at his home in New York on February 16 from hardening of the arteries, aged 53 years. Mr. Robinson retired from the Cambria Steel Company on its consolidation into the Midvale Steel & Ordnance Company and had been residing since in New York.

A. H. Ackerman, formerly vice-president and general manager of the United States Light & Heat Corporation, Niagara Falls, N. Y., and C. C. Bradford, formerly sales manager of the same company, announce the formation of the Bradford-Ackerman Corporation, with offices in the Forty-second Street Building, New York, to represent manufacturers of railway and electrical supplies for domestic and export trade.

Luman R. Dewey has been appointed western sales manager of the American Brake Shoe & Foundry Company, with headquarters at Chicago. After being connected with the mechanical department of the Chicago, Burlington & Quincy for 17 years, he was appointed chief service inspector of the American Brake Shoe & Foundry Company. Later he was assigned to the selling force, with which department he was connected until his appointment as western sales manager.

Chas. J. Stark has been appointed editor of the Iron Trade Review succeeding George Smart, resigned. Mr. Stark has been associated with the Iron Trade Review since 1907 and since February, 1910, has been in New York in charge of the metropolitan office of the Penton Publishing Company, publishers of the Iron Trade Review. He will be succeeded by Edgar C. Kreutzberg, since August, 1910, associate editor in charge of the New York office. Guy F. Creveling, financial editor, at Cleveland, succeeds Mr. Kreutzberg.

F. Lloyd Mark, who for the past year has operated a sales engineering business in Chicago, Ill., has been appointed western sales manager of the Stroh Steel-Hardening Process Company, with headquarters in the same city. He left the Crane Company in 1910, with which concern he had been connected for four years previous as a sales engineer in the refrigerating material department, to become associated with the Mark Process Dryer Company. In 1914 he started a sales engineering office in his own name, marketing iron and steel products, and later went to Pittsburgh, Pa., where he was employed by the United States Steel Corporation. He left the corporation to become assistant to the sales manager of the Kennedy-Stroh Corporation of Pittsburgh, in general charge of advertising and production. About a year ago he returned to Chicago to reopen his sales engineering agency.

Frederick E. Reed, founder of two of the units of the present Reed-Prentice Company, Worcester, Mass., died at his home in Thompson, Conn., Feb. 18, after a short illness from paralytic shock. Mr. Reed, who was nearly 70 years old, had been active in machine-tool building from 17. He was first employed as a bookkeeper for the Wood & Light Machine Company, Worcester, in which his father, John Reed, had an interest. Later he became chief draftsman for the same company. In 1875 he bought the interest of Vernon Prentice in the firm of A. F. Prentice & Co., and in 1877 became sole owner of the business which, as the F. E. Reed Company, became one of the best known manufacturers of lathes. In after years he organized the Reed-Curtis Machine Screw Company and the Reed Foundry Company. He retired from active business in 1912, when all three of the enterprises in which he had been most prominent were absorbed into the Reed-Prentice Company. Mr. Reed was also heavily interested financially in other Worcester industries, notably the Mathews Manufacturing Company and the Worcester Lawn Mower Company.

At the recent annual meeting of the board of directors, Paul Judson Myler was elected president of the Canadian Westinghouse Company, Ltd., of Hamilton, Ontario, Canada, H. H. Westinghouse, retiring president, being elected chairman of the board. Mr. Myler was born in Pittsburgh, April 24, 1869. He was educated in the public schools of Pittsburgh, graduating from the Pittsburgh Central High School. He began his business career as bookkeeper in a Pittsburgh produce commission house. In 1886 he entered the employ of the Westinghouse Air Brake Company as bill clerk in its Allegheny shops, and advanced rapidly through the several bookkeeping and auditing positions of the company. In 1896 he was appointed secretary of the Westinghouse Manufacturing Company, a corporation then being organized with a capital of $500,000 to do a general manufacturing business in Canada, at Hamilton, Ontario. In 1897 he was made secretary-treasurer. In 1903 the company was reorganized as the Canadian Westinghouse Company, Ltd., capital $5,000,000, to take over the Westinghouse Electric & Manufacturing Company's electric business and the air brake business of the Westinghouse Manufacturing Company. Mr. Myler was made vice-president and general manager in full charge of the Westinghouse interests in Canada. Mr. Myler is also a director in a number of other financial and manufacturing companies.

P. J. Myler

The McGraw-Hill Publishing Company, Inc.

The McGraw Publishing Company, Inc., and the Hill Publishing Company of New York have consolidated as the McGraw-Hill Publishing Company. Inc. The new company acquires all the properties and interests of the two constituents, including the Electrical World, Electrical Merchandising, Electrical Railway Journal, The Contractor, Metallurgical and Chemical Engineering, American Machinist, Power, Engineering News, Engineering Record, Engineering and Mining Journal, and Coal Age.

The Engineeeing News and the Engineering Record will be consolidated as the Engineering News-Record, with Charles Whiting Baker as editor.

The officers of the new company are: James H. McGraw,

president; Arthur J. Baldwin, vice-president and treasurer; E. J. Mehren, vice-president and general manager.

It is said that the new company will be the largest engineering publishing house in the world.

Baldwin Locomotive Works

The gross sales of the Baldwin Locomotive Works in the year ended December 31, 1916, were $59,219,058, including contracts for locomotives and other regular work to the amount of $33,605,025, and for shells, $25,614,033. These gross sales compared with $22,083,011 in 1915. The total earnings (including $300,000 derived from the dividends of the Standard Steel Works Company) were $9,444,642. Reserves to the amount of $6,825,176 were provided for depreciation, amortization charges to capital surplus and payment of interest charges, leaving $2,619,466. During the year dividends of $1,400,000 were paid on the preferred stock, leaving a surplus of $1,219,466. The total surplus on December 31, 1916, was $8,949,624.

President Alba B. Johnson, in his annual report, says in part:

"During the entire year the plant has been operated as nearly to its maximum capacity as was consistent with the extraordinary conditions affecting both labor and materials brought about by the war in Europe. The work was greatly hampered and retarded by the scarcity of labor and the difficulties in obtaining prompt deliveries of materials.

"In the report of December 31, 1915, reference was made to new shops constructed on the company's property at Eddystone, suitable for eventual use for the construction of locomotives, but which are meanwhile occupied under lease by the Remington Arms Company of Delaware (now become a subsidiary of the Midvale Steel & Ordnance Company) and by the Eddystone Ammunition Corporation of New York.

"As then stated, the works have derived as a profit the value of the buildings. Readjustments of both contracts have since been made by which a fixed monthly rental is payable by the Remington Arms Company of Delaware, in lieu of a further rental payment upon each rifle manufactured; and in the case of the Eddystone Ammunition Corporation, the rate of rental per shell manufactured has been reduced, and in lieu thereof a contingent profit is substituted.

"The construction of the new pier at Eddystone and the dredging of the river surrounding it, have been completed. The 50-ton crane will shortly be erected, which will permit of loading locomotives on seagoing vessels directly from our own property. In view of existing railroad congestion and embargoes, and in view of the large amount of export work under construction, this addition to our facilities should prove of great value.

"The eventual utilization for locomotive construction of the buildings now leased to the Eddystone Ammunition Corporation and the Remington Arms Company of Delaware, when vacated by them, will release corresponding space in the Philadelphia shops. The problem of finding suitable employment for this space has received careful consideration. It is desirable to utilize it in a line of manufacturing less subject to variations of demand than railway equipment. The Southwark Foundry & Machine Company has developed a successful business in constructing hydraulic machinery, internal combustion engines, and similar machinery. The demand for its product exceeds its manufacturing capacity. There promises to be a large demand for its Southwark-Harris internal combustion engine of the Diesel type. After investigation by a committee of the board, it was determined to purchase the common stock of this company, amounting to $650,000, and to obtain an option on its preferred stock and bonds. The large volume of locomotive business has necessitated the construction of an additional machine shop, a superheater shop and an extension to the smith shop at Eddystone. The demand for locomotives has required the withdrawal of special work from all the locomotive shops, and the machining of shells has accordingly been concentrated in a building erected between Eighteenth and Nineteenth, Hamilton and Noble streets. The aggregate cost of these buildings is $1,567,752. An extension of the foundry at Eddystone is under construction, but no part of its cost is included in the accounts of 1916.

"In addition to the buildings constructed for rental, as above stated, the expenditures for real estate, buildings and machinery for the year, aggregate $11,443,488. There has been charged against the operations of the year, for maintenance and renewals, $2,236,971.

"The locomotive business at the beginning of 1917 is unprecedentedly favorable."

The balance sheet follows:

Assets		Liabilities	
Plant and equipment	$43,766,500	Preferred stock	$20,000,000
Investments	5,077,199	Common stock	20,000,000
Inventories	14,334,204	First mortgage bonds	10,000,000
Accounts receivable	9,451,693	Accounts payable	4,651,921
Bills receivable	1,207,162	Payroll and salaries	252,384
Marketable securities	902,625	Bills payable	11,000,000
Cash	1,212,199	Deposits	1,061,043
Deferred charges	3,067,774	Special deposits	2,298,452
Advances acct. engs., etc.	40,986	Employees' Benefit Assn.	285,499
Sinking fund	419,550	Accrued interest	83,334
		Interest rec. in advance.	23,085
		Interest in sinking fund.	19,550
		Reserve for adjustments, etc.	255,000
		Reserve for depreciation.	600,000
		Surplus	6,085,303
		Capital surplus	2,864,321
Total	$79,479,892	Total	$79,479,892

Pressed Steel Car Company

The Pressed Steel Car Company in the year ended December 31, 1916, had gross sales of $31,202,646, compared with about $17,000,000 in 1915, but with $31,000,000 in 1913. Profits for the year's business was $1,876,152, as compared with $449,815 in 1915. These profits amounted in 1916 to 15 per cent on the common stock as compared with only 3.6 in 1915. In 1916 dividends were paid to the amount of $531,250, leaving a surplus of $1,344,902.

President F. N. Hoffstat, in his report to the stockholders, says in part:

"Orders placed for the entire year were larger than those placed in any year since 1906, but as these purchases were made late in the year the railroads will receive little benefit until the second half of 1917. The failure of the railroads to purchase more cars may be accounted for in part by the agitation of employees for increased wages and in part by the fact that everything they use costs more, but while they were and still are unable to secure increased revenues for the only commodity they have to sell, transportation, we feel the time is surely coming when the public will insist that a fair and reasonable margin between costs and rates received for transportation be allowed the railroads so as to permit of their accumulating a sufficient surplus out of which a proper quota of equipment may be purchased and adequate terminals provided to take care of increased business in active times. This will result in a substantial and uniform business for your company.

"Shipment of the Russian cars, which was delayed owing to closing of the Panama Canal, inability to secure vessels, freight embargoes, etc., was completed during the year. The cars are now in operation in Russia and are giving entire satisfaction, and as money, and the necessary vessels become available other orders for cars for Russia have been and will be placed in this country."

"Notwithstanding labor and material prices have advanced to a higher level, and there should result from those conditions a slowing down of demand, we feel confident domestic business has gained such impetus that there will be an increased demand for equipment, both at home and abroad, regardless of an immediate or delayed peace in Europe.

"We enter the year with a comfortable order book, mostly domestic, but the financial results for 1917 will largely depend on our ability to secure a regular supply of raw materials and labor. We are led to believe that if peace comes soon there will be an increased demand for replacement of rolling stock abroad so as to put railroads there in a position to serve quickly their industries and to do this will require an ample number of new car units.

"During the year $620,885 was expended in construction and equipment of additions and also for special machinery needed for the manufacture of foreign cars. In addition, we disbursed $68,524 for the purchase of additional land adjoining our McKees Rocks Works."

The balance sheet follows:

Assets		Liabilities	
Properties	$27,913,694	Common stock	$12,500,000
Securities	3,133,147	Preferred stock	12,500,000
Taxes and ins. not due	11,893	Accounts payable	6,728,136
Accounts receivable	6,307,252	Accrued wages	238,984
Inventory	3,391,044	Accrued dividends	437,500
Cash	2,664,660	Contingent reserve	800,000
		Surplus	10,217,069
Total	$43,421,689	Total	$43,421,689

Railway Construction

ANTHONY & NORTHERN.—A contract for the grading of an extension from Larned, Kan., to Hays City, 57.3 miles, has been awarded to F. M. Thompson of Larned. About 8,000 cu. yd. of material will be handled per mile, the maximum grade will be 0.80 per cent and the maximum curve 5 deg. A pile trestle 476 ft. long will be erected over the Smoky Hill river. About 20 other small bridges will be required. This work, including all track laying, will be done by the company's own forces. Several counties through which the extension will pass have already voted bonds.

CAROLINA RAPID TRANSIT COMPANY.—This company is planing to build about 70 miles of electric lines for which preliminary surveys have been made. The lines are to connect Spartanburg, S. C., with Union, Laurens and Clinton, but it has not yet been decided when the construction work will be started. The maximum grade is to be 1 per cent and the maximum curvature 6 degrees. There will be 8 steel bridges and 2 sub-stations on the line. The company expects to develop a traffic in coal, cotton goods and farm products. J. F. Jacobs, president, Clinton, S. C., Reid Tull, chief engineer, Spartanburg.

NEW YORK, NEW HAVEN & HARTFORD.—This company will probably let contracts within the next two months for building a line from South Bay Junction, Mass., to the Boston freight terminal, about three-fourths of a mile. The work involves handling about 116,000 cu. yd. of excavation and there will be 6,300 cu. yd. of gravel filling and 15,000 cu. yd. of concrete masonry. The plans include the construction of 11 overhead highway bridges and the work will require 1,130 tons of steel, 40,000 ft. b. m. of timber and 7,830 cu. yd. of concrete masonry. The improvements also include the construction of a pumping plant with maximum capacity of 3,000 gals. per minute.

PENNSYLVANIA DETROIT.—This company has filed articles of incorporation at Lansing, Mich., with capital stock of $5,000,000. The company was organized to build a 52-mile line beginning at the Ohio-Michigan state line, and extending northward through Monroe and Wayne counties to Detroit.

UNION PACIFIC.—This company will construct permanent concrete snow sheds at various points along its lines now affected by occasional snow blockages. Work has already been started on temporary wooden sheds which will give some protection, but these are to be replaced in the near future by more permanent structures. The estimated cost of these improvements will be $1,000,000.

RAILWAY STRUCTURES

ATKINS, IOWA.—The Chicago, Milwaukee & St. Paul has started work on its new terminal facilities at this point. Ten new buildings will be erected, including a 26 stall roundhouse, a Robertson cinder hoist, a coal handling plant, a machine shop and power house. The buildings will be of brick with concrete foundations. About 68,500 lineal ft. of new tracks will be laid which will require approximately 240,000 cu. yd. of grading. The estimated cost of this undertaking is $650,000.

JACKSONVILLE, Fla.—Bids will be opened by the Jacksonville Terminal Company on March 6, instead of March 18, as previously reported, for work on the union passenger station at Jacksonville. (February 23, p. 338.)

RICHMOND, Va.—The Richmond Terminal Company has given a contract to the John H. Parker Company, New York, at $709,800 for building the union passenger station on West Broad street, Richmond. The station is to be used jointly by the Richmond, Fredericksburg & Potomac and the Atlantic Coast Line. The work is expected to be finished in about one year. (January 12, p. 80.)

YOUNGSTOWN, Ohio.—An agreement has been reached between the city authorities of Youngstown and the Erie Railroad for the elimination of grade crossings and the construction of a new passenger station at Youngstown. (November 24, 1916, p. 968.)

Railway Financial News

BOSTON & MAINE.—Judge Morton has refused to discharge the receiver of the Boston & Maine. Minority stockholders had petitioned for a discontinuance of the receivership on the ground that the appointment of a receiver was obtained improperly. Judge Morton said: "The case presents to my mind nothing but an acute difference of opinion upon a matter of business policy and action between the directors and the owners of an overwhelming majority of the stock on one side, and a comparatively small and contentious group of minority stockholders on the other."

MISSOURI PACIFIC.—The property of this company and of the St. Louis, Iron Mountain & Southern has been sold under foreclosure. The selling price, which was the upset price, was $16,150,000 for the Missouri Pacific and $23,500,000 for the St. Louis, Iron Mountain & Southern. R. H. Neilson, representing the reorganization committee, and Duncan A. Holmes, representing Kuhn, Loeb & Co., were the purchasers.

NEW YORK CENTRAL.—President A. H. Smith has issued the following notice: "When stockholders were given the right to subscribe for additional New York Central stock, that stock was at a premium. The time within which subscriptions were to be made has not yet expired, and the market value has now fallen below par. Holders of warrants who have signed their subscriptions may cancel them, providing that on or before March 1, 1917, they notify Edward L. Rossiter, treasurer, Grand Central Terminal, New York, of their election to do so. Payments made on subscriptions which are so canceled will be returned by the company."

SOUTHERN RAILWAY.—Announcement was made last week in these columns of the abandonment for the present of the exchange of development and general mortgage 4 per cent bonds for new 4½ per cent bonds, and the sale of an additional block of new 4½ per cent bonds.

The company has arranged to sell to J. P. Morgan & Co., the First National Bank and the National City Bank, all of New York, an issue of $25,000,000 2-year 5 per cent notes, dated March 2, 1917. The bankers are offering these notes to investors at 99. The notes are secured by the deposit of $43,500,000 development and general mortgage 4 per cent bonds. From the proceeds of these notes the $15,000,000 notes which mature in February and March are to be paid, as is also a bank loan of $6,000,000 which was arranged for in connection with the purchase of the New Orleans & Southeastern.

SPANISH IMPORTS OF RAILWAY SUPPLIES.—During the normal years of 1911, 1912 and 1913 Spain imported annually an average of 50,000 tons of railroad material, such as cars, locomotives, wheels, tenders, etc., whereas in 1914 and 1915 together these imports only amounted to 31,000 tons, an annual average of 15,500 tons.—*Commerce Report.*

ICY ICING INTENSIFIED.—During the season ending October 31 last the Pacific Fruit Express Company used for icing refrigerator cars in the state of California 385,279 tons of ice. Of this amount about one-half was manufactured in Colton, Los Angeles and Roseville. This quantity melted would equal 92,466,960 gallons of water; or, in cakes, equals 2,568,526 cakes of ice weighing 300 lb. a cake, each block 37 in. long.

JAPANESE STEEL PLANT FOR MANCHURIA.—A new steel plant will be constructed in Manchuria early this year by the South Manchuria Railway. It will be operated in connection with an iron mine that is located in the An Shan Chan region, between Liaoyang and Heicheng. It is expected that the steel plant will produce at least 150,000 tons per annum at first. An abundant supply of lime is available not far from the iron mine and most of the coke will come from the Fushun mines, which are likewise owned by the South Manchuria Railway. The railway company has acquired a large tract of land so that operations may be indefinitely extended. The work will begin some time in April, soon after the Spring thaw.—*Commerce Report.*